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ABSTRACT

Papers on Third World academic, research, and medical libraries and their role in scientific and technical information transfer, which were presented at the 1983 UNESCO/IFLA (United Nations Educational, Scientific, and Cultural Organization/International Federation of Library Associations) seminar, include: (1) "Development of Effective Acquisition Policies" by John Ndegwa (Kenya); (2) "Parameters of Expenditure: The Allocation of Funds to the Purchase of Materials and Services to Support the Information Needs of the University Community in Science and Technology" by Michael E. Gill (Barbados); (3) "Acquisition of Foreign Periodicals in Developing Countries: The Example of Brazilian Libraries" by Heloisa B. Schreiner, Rejane R. Klaes, and Mayra E. Brum (Brazil); (4) "Problems of Acquisition of Overseas and Local Materials" by B. U. Nwafor (Nigeria); (5) "Collection Building and Information Services for Material in Special Categories Relevant to Third World Use. I: Agriculture" by Clemence R. Namponya (Malawi); (6) "Collection Building and Information Services for Material in Medicine Relevant to Asean (Association of Southeast Asian Nations) Countries" by Uthai Dhutiyabhodhi (Thailand); (7) "New Information Technologies Available in the Industrialised World" by Stephen W. Massil (United Kingdom); (8) "Choosing the Moment: A Review of the Organizational Problems and Changes Arising Out of Conversion to Computerized Systems" by H. T. Lim (Malaysia); (9) "The Application of Automation to the Library Processes of the National Autonomous University of Mexico" by Roberto Garduno (Mexico); (10) "Using Automated Systems for Scientific and Technical Literature Searches" by Joseph C. Anafulu (Nigeria); (11) "Future Training Needs [of University Library Personnel]" by Hudwell Mwacalimba (Zambia); and (12) "Development of Modern Information Technologies and Their Impact on Research" by Michael E. Gill (Barbados). (ESR)

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DEUTSCHES MUSEUM MUNICH

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Development of effective acquisition policies

by

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ABSTRACT

It is accepted that the most important element of a university library is its collections and that to facilitate their development an acquisitions policy is necessary. This becomes even more so as financial constraints increase. The policy should be used to justify expenditure on library materials as well as to ensure the growth of the collections is balanced and stable, irrespective of who selects the materials.

For a library acquisitions policy to be effective, it must identify its users and their requirements. It should indicate levels of provision of each group of the library's clientele, both in the materials required and in financing. There should be guidance to selectors regarding textbook provision and duplication, treatment of non-book and non-print media. The conditions under which materials are acquired through gifts, exchange or deposit should be spelled out as should the justification and process of discarding unwanted material.

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DEVELOPMENT OF EFFECTIVE ACQUISITION POLICIES

by

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INTRODUCTION

When one wishes to discuss factors which require to be considered in the development of effective acquisitions policies, it is necessary to create, at least in the mind, an ideal, or near ideal, library situation. Many libraries, whether in developed or developing countries, would wish to have such policies. However, due to the problems of one type or another that beset them, they find themselves unable to accomplish what they believe should be done. In the words of Ted Grieder (1) we have to imagine, among many other suppositions, "that the Acquisitions Department possesses sufficient able personnel, professional and clerical, and financial backup" to create an atmosphere under which it is possible to concern the library with the various details of an effective policy of acquisitions.

In developing countries, librarians are confronted with many problems concerned with the acquisition of library materials. They have to attempt to convince administrators, many of whom do not readily understand the functions of libraries and information, of the necessity for sufficient financial provision for books, periodicals and other library materials. They have to cope with the dearth of qualified professional library personnel for selection purposes and in the case of university libraries, the resultant use of teaching staff as selection agents with all the disadvantages this may have. As most of the publications required are published in foreign countries, librarians have the problems of receiving approval from their national authorities to utilize the never sufficient foreign exchange for the purchase of library materials from overseas. As conditions for such payments require that the supplies be received before they can be released, there are constant difficulties with library suppliers who require payment within a specified time which usually expires before the receipt of the goods. In the case of local publications, librarians are preoccupied with attempting to identify what has been published in view of the inadequacy of the local book trade. In the African context, difficulties in library acquisitions are discussed in more detail by, among others, J.A. Ombu (2), O. Jegede (3) and S.A. Osiobe (4) in the case of West Africa and R. Wanja Thairu (5) as far as East Africa is concerned. With all these problems to contend with, it is not too surprising that not much literature in the developing countries has concentrated on the details of acquisition policies although practically all the authors in question have emphasized the need for clear acquisitions policies. In view of the staff time and energy that the preparation of a detailed acquisitions policy requires, it would seem that many libraries in the developing world have found the exercise rather daunting.

NEED FOR AN ACQUISITIONS POLICY

Practically all libraries have an acquisition policy of some kind. Otherwise, it would be difficult to explain why a library decides to purchase a title and rejects another, however invalid the actual reason may be. Such policies may exist in the mind of the librarians or in various memos. They may be simply that, funds allowing, the library purchases what the faculty staff request. However unsatisfactory these may be deemed to be, they are nevertheless policies in some sense. When it comes to a detailed written acquisitions or (to use a more "with it" term) a collection development policy, this is a different matter.

Even in developed countries, written acquisitions policies are not as common as one would expect them to be. A survey of United States and Canadian libraries carried out and edited by Elizabeth Futas (6) indicated that many libraries in the two countries did not have written acquisitions policies. Some of the reasons quoted are illuminating such as:-

> "Our library does not have a written policy for book purchasing or for periodical subscriptions. The general rule is in effect to buy wisely, which is rarely observed."

and: "Our library has never operated under a written acquisitions policy nor are most policies a matter of written record. A variety of memos are in existence and do cover various situations that have arisen in the past. However, I am not in possession of these memos".

or: "After much discussion over a period of years, the faculty and library bibliographers, in concert, tore up whatever written acquisitions policy was available".

or perhaps the apologetic:

> "We have no written policy regarding book acquisitions - would that we did! We buy almost everything that faculty requests, and attempts to get this into a budgetary framework has been futile. I realise as well as you do that this is not the way to run a library, but am having a hard time convincing the faculty of this."

While Y.T. Feng (7) emphasizes that the purpose of formulating a collection development policy should not be to save money by the library, it is evident that many libraries have found financial constraints to be a major impetus for preparing acquisitions policies. In the United States, where collection development policy activity seems to be stronger than elsewhere, it would appear that this increased considerably in the 1970s when inflation, rising prices and devaluation were, repeatedly, mentioned as major problems in libraries' annual reports. According to R.M. Magrill and M. East, "By 1972, most research libraries had found that their budgets had declined in purchasing power if not in amount, while demand for materials not only continued but increased... Administrative adjustments in many libraries began with formalization of collection procedures, formulation of collection development policies, efforts toward formulas for budget allocation ..."(8). Even Feng accepts that budgetary limitations necessitate the setting of priorities, which in turn requires a reexamination of the objectives of the library (9) and gives this requirement for self-examination and reflection as important in itself when justifying a written policy for collection development.

One of the most important reasons for having a library acquisitions policy is to make sure of a continuing consistency and balanced development of library collections. The American Library Associations' Collection Development Committee when preparing "Guidelines for the formulation of collection development policies" (10) assumed that "a written collection development policy statement is for any library a desirable tool which enables selectors to work with greater consistency towards, defined goals, thus shaping stronger collections and using limited funds more wisely." Futas states that a written policy "encourages stability and continuity in the library operations" (11) while to Feng also, such a policy statement "assures a consistent and balanced growth of library resources" (12). Selectors of library materials in a university can be librarians, subject specialists or teaching staff. Not only do such staff change but they may have their own biases. An acquisitions policy will make it possible for the selectors to be more balanced and can be used to train new staff.

An acquisitions policy is also a tool for justifying the expenditure of university funds for library collection development. As stated before, university administrators are not always clear as to the role and functions of the library services. As the library materials budget is one of the largest single item of expenditure in a university, it often becomes the victim to pruning whenever university expenditure needs to be reduced. One can give other reasons why an acquisitions policy is required in a university library but I hope that enough has been said for this purpose at the present time.

FACTORS IN A UNIVERSITY LIBRARY ACQUISITIONS POLICY

My brief for this paper has been to give a theoretical analysis of factors that should be considered in the development of an effective acquisitions policy. As this seminar is concerned with university libraries, it is assumed that we are mainly concerned today with acquisitions policies in university or academic libraries.

The most important element of a university library is its collections and all the operations in the library revolve around them. For a library service to succeed, the collections must be built up continuously. This calls for the assessment of the collections to identify strength and weakness and the selection of new materials for acquisition. This selection is carried out by different people in different libraries. In the small university library, the one or two librarians may be solely responsible for selection. In others, the teaching staff may be mainly concerned while library subject specialists could be the selectors in the larger libraries. In very large universities, the responsibility of collections development will rest with a Collections Development Committee with the Acquisitions Librarian (with various titles in different libraries) heading the group. To enable those responsible to carry out this task properly, they have to operate under some objectives, goals and guidelines which when written are termed acquisition policy statements. The effectiveness of these guidelines depend on their comprehensiveness in covering various situations and it is our intention to attempt to outline those factors that should be covered in such statements.

In doing this, it has become necessary to depend heavily on the considerable literature on the subject of collection development from the United States, particularly those already cited in the earlier part of this paper. While it is not my intention to repeat these references, I hereby acknowledge the use made of these authors' work. In addition, I am indebted to articles by C.B. Osburn (13)(14) and Marion L. Buzzard (15) which have not been quoted hitherto.

THE UNIVERSITY AND COMMUNITY

A university library service is part and parcel of the university it belongs to and its development is closely related to the growth of the university as a whole. It is also affected by the community around it and the service it is expected to render to it. The acquisition policy for a university library must therefore consider its clientele in the university, including students, teaching staff and the administration. It has to analyse the various departments, courses offered in each and at what level. It is necessary to identify research areas and projects by staff and postgraduate students in the various departments and institutes. In many cases, particularly in developing countries, the university is the major research institution and has the general role of encouraging, sponsoring and coordinating research. Many professions in the community look up to the university for guidance and revitalization. All these are factors that must be considered and identified when framing a university library acquisition policy.

THE UNIVERSITY LIBRARY SERVICE

It is essential to understand clearly the role of the library service in the university, within the community and its relationship with other libraries. Its goals and objectives should be defined, thus enlarging on the way the library assists in the fulfilment of the needs of the university and the community it serves.

Details of the service itself should be outlined, whether it is a single library or a multi-library system and what each of the libraries contains. Whether there are separate departmental libraries, with what responsibilities. If collections are divided into undergraduate and research collections and whether the university library includes non-curriculum and recreational collections. This analysis is particularly important when the acquisitions policy is for the use of both library staff and the university community as well and where the selection of materials is done by or in conjunction with members of the faculty.

No library will be able to acquire all the materials it needs. The university library has therefore to consider what resources exist in other libraries which would be available to it and whether it is necessary to duplicate such materials in its own collections. Where specific co-operative acquisition and/or inter-library loan schemes are in existence, its responsibilities in such a programme must be considered in the library's acquisition policy.

FLEXIBILITY

A university as a growing institution has to continue changing its emphasis. The library must therefore be geared to adopt to such changes. In its acquisitions policy, the university library needs to reflect developments in instructional methods, new areas of teaching, emphasis on research or even the abandoning of certain areas of teaching. It is important therefore that the library, through its chief librarian and staff be closely concerned with the total university planning so that they can be aware of changes long before they come into operation.

Outside the teaching and research programmes, the library acquisitions policy will require to adopt due to financial constraints, changing community around it, publication trends and any developments in the library services around it.

It is therefore necessary for a library acquisitions policy to be regularly reviewed and where necessary revised to take into consideration any changes that occur in the requirements of those it serves.

SELECTION OF MATERIALS

The library acquisitions policy is a guide for those who select library materials. It is therefore necessary to specify who are responsible for carrying out the selection. Where the university faculty is concerned with the selection of library materials it is necessary to outline how this is to be done and who is finally responsible for the decision on what will be acquired. In the case of library staff, identity of those responsible for various areas and/or types of material should be outlined.

The factors concerned with the actual selection of library materials are what is termed by many writers as "the heart" of a library acquisitions policy. While other parts of the policy outline the philosophy behind what the library acquires and its general objectives, this part of the policy statement should outline the criteria for selecting materials and the level of selection. The most advocated method for doing this is by listing subject areas, by use of a library classification scheme, and identifying the levels of selection for each. The American Library Association's Guidelines for the formulation of collection development policies identifies five main levels of collection density as follows:-

A. Comprehensive level. Where a library includes, as far as possible, all significant works of recorded knowledge. Normally this level is only used in "special collections" whose aim is to be exhaustive.

B. Research level. This is a collection which would include the major source materials for postgraduate and independent research with all important reference works and specialised monographs together with an extensive collection of journals and the major indexing and abstracting services in the subject.

C. Study level. This level would be expected to be adequate for undergraduate and graduate course work and sustained study but at a lower level than the research intensity. It should contain the basic monographs by important writers, a selection of works by secondary writers and a representative selection of journals in the field.

D. Basic level. A selective collection serving to introduce and define the subject indicating that more information would be available elsewhere. Includes major dictionaries and encyclopaedias, selected important monographs and bibliographies and a few major periodicals.

E. Minimal level. Where the subject in question is not included in the scope of the library, where only the very basic reference tools and little else is acquired.

In discussing the selection of materials for a university library, there are certain "problem areas" that need to be considered.

A university library has to decide on whether it will acquire course textbooks and whether it will duplicate any publications acquired. Any duplication of materials means the purchase of fewer titles and decisions on this matter have, therefore, an important effect on library collections. Some university libraries have undergraduate collections while others have reserve (short loan) collections housing heavily used materials and this has to be taken into consideration when decisions on selections are made.

A considerable amount of publishing is carried out in paperbacks, and in some cases, publications are only available in soft cover. It is necessary to consider when, if at all, paperbacks should be acquired and how they should be treated. Other problem areas which should be considered include those concerned with government publications (national or foreign) and publications in languages other than the accepted "university language". In developing countries this latter is an extremely complex question. Many universities in these countries use a foreign language as its media of instruction and research. They have also developed departments which teach other foreign languages. In addition there are publications in the languages of the country itself. It is necessary, therefore, for the university library to have a clear policy on how to treat all these languages in its collections.

Selection for a university library collection includes not only books and periodicals but other print materials such as newspapers pamphlets and maps. In most cases, it also includes at least some non-print media like microforms, tapes, audio cassettes, tapes, video cassettes and so on. Some of these materials may be treated in the same manner as print media. For instance, the acquisition of a dissertation or a volume of a journal in microfilm may be handled similarly with those in paper form. A decision on this has to be made.

ALLOCATION OF FUNDS

Each university library receives a budget, from the total university grant and/or other sources, for the acquisition of library materials. The amounts received in this way constitute one of the major restrictions as to what materials the library can acquire. The budget may be separated at source having specific funds for books, periodicals and even back sets of periodicals while in other cases, there is one budget covering all types of library materials. Where special grants are concerned, these may be identified for particular subject areas or by individual faculties.

One of the most effective ways of achieving a balanced growth of library collections is the allocation of the total budget, in whichever way it is granted, and whoever does the actual selection. As the periodical subscriptions are a continuing commitment, it is normal to separate funds for them and then allocate the balance according to various subject fields.

The criteria used for allocating funds have to recognise various factors. Existing collections have to be considered, new and developing areas being allocated sufficient funds to build up basic collections. Sizes of faculties and departments in the form of undergraduates, postgraduates and academic staff together with the number of courses being taught and graduate programmes in each have all to be related to allocations allowed. In allocating for research programmes, it should be recognised that certain subject areas (e.g. the sciences) depend more on current periodical literature while the humanities and many social sciences will require books and back sets of periodicals.

ACQUISITION WITHOUT DIRECT PURCHASE

Most university libraries acquire materials through methods which do not require their purchase and the library should be clear on how to deal with such acquisitions.

University libraries in developing countries have benefitted considerably at one time or another through gifts from developed countries, either from government agencies or private institutions. With some of these, the library is asked to identify the material it requires (with the possible restriction on country of publication) which are then acquired and sent. In such cases, there are hardly any problems as the library in question uses similar selection criteria as for purchase. Other agencies, however, make their own decision on the materials they obtain for the library. Other gifts to university libraries are from academic staff in the university or in other universities, well-wishers and friends. It is important that the library should be clear on how such gifts are to be handled and to inform the donors. It has to be understood that the processing of such gifts take a lot of staff time and the library must be at liberty to dispose of them if they do not add to the real development of its collections.

Another method for a university library to receive materials is that of exchanging publications of its own university with those of another university or research institution. In these times when foreign exchange regulations in many developing countries are strict and cumbersome, many libraries have found it easier to receive journals published in universities of other developing countries through exchange. However, the library must be quite firm in selecting its exchange partners so that it only receives materials which fit in its own acquisition policies. Another field of exchange is that of duplicate or unwanted issues of periodicals, but this can be extremely expensive in staff time and transportation and should be used only when absolutely necessary.

University libraries receive publications under deposit arrangements. Some are depositories of publications in their own countries and receive these under the national deposit laws. Others are deposits for various international organizations such as the United Nations, Food and Agricultural Organization of the U.N., the World Health Organization, Unesco, United Nations Enviroment Programme, United Nations University, etc.

These organizations have conditions that depository libraries are obliged to adhere to. Libraries receiving materials under such arrangements have to be willing and able to treat such publications in accordance with those conditions.

WEEDING

Although we have so far been concerned with the acquisition of library materials, all university libraries have the problems of de-acquisition. The quality of a library collection will not be reflected by what it has acquired in the past but what it contains at the particular time. No library wishes to keep everything that has ever been acquired. Space is required for new materials and it is anyway expensive to keep materials which are never used. Obsolete and out of date materials could even be harmful in providing information which is no longer valid. Changes in university policy could make materials which were important in the past to be no longer required. Books, like all other things, get worn out and torn.

Because of all these and other reasons, a university library should have a policy on discarding of books. This may include those publications which may be removed from the general library collections but instead of being discarded, kept in special storage, either within the library building or in a special store outside. Other materials will, having served their use, be designated for disposal from the library altogether. The policy for this exercise should be clear enough, not only for the library staff and the faculty, but sometimes for the satisfaction of administrators and auditors who tend to regard library collections in the same light as other university stock, each item of which has to be accounted for permanently.

CONCLUSION

When students in my university were making critical comments on the various areas of university activity, they included the library service in their attacks. However, their concern was not of the length of time it takes them to have a book issued or other administrative problems which I had been concerning myself with but that the collection was becoming "out of date and archaic." In a recent investigation carried out on the same university by a committee from outside, appointed by the President, comments made by the Faculty were also exclusively regarding the weaknesses in the library collections, mainly in connection with periodical late arrivals. While these criticisms were genuinely due to lack of funds and the problems of foreign exchange, they showed that as far as the users of the library were concerned, the most important element of the service were the library collections.

During the preparation of this paper, I have had the occasion to read more on the subject of library acquisitions than I would normally have done in the normal practice of my professional duties as I have then tended to concentrate on library management, buildings and automation. This has given me a deeper understanding into problems of library collection development than I had before and I must thank the organizers of this pre-session seminar for making it necessary for me to do so. It is my hope that other participants will also benefit through the discussions on this important aspect of our profession.

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DEUTSCHES MUSEUM MUNICH.

Parameters of expenditure:

The allocation of funds to the purchase of materials and services to support the information needs of the university community in Science and Technology.

by

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PARAMETERS OF EXPENDITURE

by

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Abstract

The Main Library at U.W.I, Cave Hill, since 1975 when its library materials vote was more securely established, has developed and applied a formula for distributing the book vote equitably among the teaching departments. There is, however, a growing concern that the book vote itself is being devalued.

Though not a strong research library in traditional terms, the library seeks to overcome this disadvantage by utilising modern literature searching techniques using telecommunication access to overseas data bases. These techniques appear to be quite cost-effective and, as they become more widespread, will significantly alter the acquisition policies of third world university libraries.

The University of the West Indies at Cave Hill, Barbados, supports undergraduate and research programmes in Chemistry, Physics, Meteorology, Biology, Biochemistry, Mathematics and Computing in the Faculty of Natural Sciences. The library support for these disciplines is provided centrally in the Main Campus library, the historical development of which, its funding and its allocation of those funds present an interesting case study of the way a small university library in a developing country seeks to provide for the academic community it serves.

The Barbados campus is the youngest and smallest of the three which together comprise the University of the West Indies. Established in 1963 to serve the Eastern Caribbean islands, and so complement the activities of the older campuses at Jamaica in the north and Trinidad in the south, it offered a programme in the Liberal Arts and concentrated initially on undergraduate studies. In 1971 the Faculty of Law was established, introducing for the first time a programme unique to the Cave Hill campus. That Faculty is served by a separate library, but its existence does not significantly affect the discussion to follow since the funding of the Faculty and its library is largely independent of the other campus activities.

The physical plant, (buildings and equipment), designed in 1963 and commissioned in 1967, was financed by a capital grant from the British Government, a grant which included a modest provision for library books. The library utilised this capital sum by drawing it down in equal instalments over five years, a procedure which would have been dictated by the limited ability of the small initial staff to process incoming material even if it had not been a condition of the grant. The practical effect of the procedure, however, was to mask the inadequacy of the recurrent library materials vote which, by the 1968/69 session, had been devoted almost entirely to periodical subscriptions - a situation caused both by the increasing cost of individual subscriptions and by the need to attempt to provide new titles to support the growing programme.

The University is financed on a triennial basis by fourteen contributing territories acting through a central University Grants Committee. The Committee has tended to base the projections into a new triennium on the level of recurrent financial support provided in the last year of the preceeding triennium. The disappearance of the allocations from the capital sum after 1968 led to two very lean triennia - 1969/72 and 1972/75. During this period the library financed its book purchases mainly through the utilisation of savings from the overall campus budget, the extent of which savings could not be known until the year was almost ended. Such funding is obviously too uncertain and too late, and was always too little.

The situation was changed as a result of the work of a Senate Committee on Library Development. The report of this university-wide committee (1) enabled all the campus libraries to seek and obtain a budget which more accurately reflected the demands imposed by the teaching and research needs of the departments served, but it is certainly true to say that the library at Cave Hill benefitted most because its previous level of underprovision had been the greatest.

In summary, the report argued that the libraries' budgets should be in the range of 7-10% of the appropriate elements of the campuses' budgets and that the provision for Cave Hill's library, because of its relative youth, its previous significant underprovision and the absence of any real capital development initially, should be at or close to the top of the range.

Within its recurrent provision each library has attempted to preserve that balance between expenditure on staff and on materials which classically has provided 25-30% for the latter.

So it was that, at the beginning of the 1975/78 triennium, the library at Cave Hill was in a position to share with teaching staff its advance knowledge of the funds available for the purchase of library materials and to indicate how it proposed to allocate those funds to faculties. This represented a significant break with tradition. No longer would the librarian hold in petto the allocations by subject. Teaching staff would be setting their acquisition priorities against a known budget, surely the most efficient way to engage their help in the exercise.

The periodicals vote, which is not subdivided by faculty, reflected the spiralling costs of subscriptions, but because the initiating of those subscriptions had each been carefully considered at the time very few cancellations were made.

The remainder of the library materials vote, which was available for book purchases, was allocated to the existing faculties as shown in Table 1 below.

Table 1.

	Allocation
Faculty	
Natural Sciences	20%
Arts and Gen. Studies	28%
Social Sciences	28%
Library	24%

The percentages chosen represented an educated guess at the influence of various factors on the proportion of the total vote which should be assigned to each faculty in order to provide for balanced growth of the collection. The library reserved 24% to use for the development of the reference collection, the West Indies Collection, and to contribute to the provision of multiple copies of texts recommended to students on the book list.

Later, in October 1978, when Education became a teaching department within the U.G.C. funded programmes, 1% was removed from each of the previous allocations to create a budget for material revelant to the teaching programme in Education.

Table 2.

	Allocation
Faculty	
Natural Sciences	19%
Arts and Gen. Studies	27%
Social Sciences	27%
Education	4%
Library	23%

By the end of the 1978/81 triennium an attempt was made to put this allocation on a more scientific basis. A formula based on four factors was introduced. It reflected at that stage the undergraduate programme only.

A - The number of students registered for a course.
B - The weighting of the course.
C - The degree of reliance on books.
D - The relative cost of books (based on the subject by subject comparison of average prices made annually by the Library association of Great Britain.

These factors were given weightings as follows:-
i)A is weighted thus:-

Table 3.

Number of students	Weighting
1 - 12	4
13 - 25	5
26 - 50	6
51 - 100	7
over 100	8

This is based on a philosophy that a core of books is necessary as soon as a course is mounted and that the need for additional titles does not grow as rapidly as class size.

ii) B is simply the number of units as they count for the award of a degree. Some are 1/2 units, a few are 2 units, most are 1 unit.

iii) C is an estimate of the reliance of the discipline on books. This factor ranges from 2 to 5, with laboratory subjects having a weighting of 2 and most other subjects getting a weighting of 5, the facilities of a library being considered analogous to a laboratory in these subjects. Mathematics was assigned an intermediate value of 3.

iv) D was based on the average cost of books in the discipline thus:-

Table 4.

Price, Sterling	Weighting
Less than 6	3
6 - 8	4
14 - 16	7
21	9

The product of the weighted factors was summed over the courses in a discipline and the disciplines in a faculty. This produced the breakdown given below.

Table 5.

Faculty	Allocation
Natural Sciences	20%
Arts and Gen. Studies	29%
Social Sciences	25%
Education	4%
Library	22%

By using student registration figures and relative average book prices as obtain in one year to provide a basis for an allocation in the following year we have a scheme that is patently out of phase. Our experience suggests, however, that neither factor changes radically from year to year.

The latast refinement, introduced at the end of 1982, acknowledged the existence of a developing postgraduate programme and introduced an element to cover the 50 postgraduate students working at the Master's and Doctoral levels in 9 departments. The students are weighted 1:1 if they are pursuing a research degree. Those doing their Master's by course work are weighted as follows:-

Table 6.

Number of students	Weighting
1 - 2	2
3 - 5	3
6 - 10	4
over 10	5

The courses themselves are weighted thus:-

Table 7.

Course	Weighting
Ph.D	5
M.Phil (research)	2
M.A./M.Sc. (course work)	3

The degree of reliance on books ranges from 2 to 10, with the laboratory subjects remaining at the low end of the scale, the course work degrees in Arts and Social Sciences given the factor 10, and the research degrees in those disciplines at both the master's and the doctoral levels given a weighting of 5, reflecting the need to consult source material which the library would not be expected to acquire.

The latest allocation taking all these factors into account is:-

Table 8.

Faculty	Allocation
Natural Science	19.4%
Arts and Gen. Studies	27.7%
Social Sciences	27.3%
Education	3.6%
Library	22.0%

The faculties are strongly advised to utilise their allocation departmentally on the basis of the calculations. Additionally, a department may convert a portion of its book vote to periodical subscriptions as long as there is a commitment to maintain the subscriptions for three years.

All university libraries have to find methods of distributing their funds between the various disciplines served. The emphasis in this seminar is on Science and Technology but the discussion in this paper, in so far as it touched on the Arts, the Social Sciences and Education, is still revelant because, in the context of the situation described, the demands of these "non-scientific" areas are as authentic as those in Science and Technology, and the satisfaction of those demands has a direct influence on the availability of funds and resources to the latter. The sharing of the cake is an appropriate analogy.

The size of the cake is also formula based, in our case, and while it is always tempting to index the library's budget to some external factor which reflects the magnitude of the demands placed on the library, it may be that in developing countries the size of the university's budget is not an entirely adequate base.

The main argument in support of this caution resides in the fact that a university is largely labour intensive. To link the library budget to the overall university budget effectively indexes the library budget to staff salaries, and since the library spends a higher proportion of its budget on non-salary heads than other departments within the university, certainly more than the teaching departments, if increases in staff salaries fail to keep pace with the increases in the cost of books and periodicals, then the purchasing power of the library for these essential items will fall, even though the library continues to receive the same proportion of the overall budget.

Staff salaries in universities in developing countries are controlled by very different factors from those which influence publication costs in developed countries and the negative differential referred to in the previous paragraph is a common experience. The cry for a method of protecting libraries from the effects of this differential has already been heard.(2)

The library at Cave Hill has only modest research potential in Science and Technology if measured against the classical standards of long runs of scholarly journals and full sets of abstracting and indexing tools. The libraries at the other two campuses do have stronger collections but the lack of a union catalogue, the speedier postal connections between each of the campus territories, (all former British colonies), and Britain than between the territories themselves, and the greater certainty of finding the desired document or article in a specialised service like the British Library, Lending Division, all prompt us to look across the Atlantic Ocean for those supplements to our own collection.

There is, of course, a charge associated with such a service, which charge has so far been borne by budget heads other than the book vote. But recent developments suggest that much greater use will be made of such a service in the future and the financing of it will become a more significant factor.

The primary development which is likely to generate the enhanced demand is the recent introduction of relatively low cost 300 baud telecommunication circuits for data transmission. We have taken advantage of our geographical proximity to North America and this new cheaper rate, (1/5 of the rate of the previous channels), to gain access to the commercial data bases. The additional costs we pay for a search amount to an effective surcharge of approximately 25% on what customers in mainland North America pay. The figure is approximate because the telecommunication charge is fixed in relation to time and to the number of characters transmitted, while the costs for using the several files, though also time based, vary significantly from file to file. Obviously the premiun we pay is proportionately higher when we use the cheaper files.

Our ability to use the data bases is of particular interest in view of our weakness in the area of published indexes and abstracts. That disadvantage, at least in relation to material from the early 1970's onward, has been eliminated and our estimate of the cost of using the service is significantly lower than the cost of subscribing to the hard copy version of all the services used. In addition, we find that some files have no published counterpart and that even when they do exist as well in published form the data base file is much more up-to-date and much easier to search.

There has been a tendency to pass on to the library user the cost of searching these data bases. While this will discourage frivolous use of the system, it can hardly be justified on other grounds. One would never, for example, charge a researcher a proportionate part of the subscription for the consultation of the published version, yet the end results of that search and the one through the data base file could be identical. Librarians in the developing countries and the community they serve have an opportunity to overcome the disadvantage that results from location in a less developed country with its more difficult access to information.

We need to be careful not to put unnecessary barriers in the way especially since the view is now widely subscribed that information has replaced energy as the critical productive input in an economy. This suggests that only those societies able to cope with the information explosion can achieve economic development.(3) In an earlier analysis of the library's use of the automated searches, Nel Bretney summarised this point by observing that "the Catch 22 situation of rejecting the new because of financial constraints and at the same time lacking access to information that would in the long run help to eradicate those constraints must not be allowed to exist."(4)

The heartening news is that Unesco plans to carry out a study to consider the possibility of a reduction in telecomunication tariffs for developing countries to enable them to exchange specialised information.(5) In countries separated by some distance from the metropolitan centres where the data bases are maintained, this prospect of reasonable rates of access should encourage a state of readiness to use the services as soon as they become available at economical rates. The near neighbours who have already achieved affordable charges are anticipating that Unesco's efforts will extend the economical range of connection to the higher speed circuits, say 2400 baud, thus allowing greater sophistication in our interaction with the computer based services.(6)

With all these new possibilities on the horizon the third world university librarian must rethink his strategy in relation to collection development, to budget allocation, to services offered, and to the charges to be made, if any, for those services.

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Acquisition of foreign periodicals in developing countries: the example of Brazilian libraries

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ABSTRACT

SCHREINER, H.B.; KLAES, R.R.; BRUM, M.E. Acquisition of foreign periodicals in developing countries: the example of Brazilian libraries.

Brazilian university libraries use two methods for subscribing to foreign journals: the use of agents, implying the bidding process, and direct acquisition from the editor. The former is by far the most common method, involving relatively title paperwork. Is is, though, less advantageous from the economic point of view. The latter method is very bureaucratized, implying the maintenance of a small subscription agency inside the acquisition department. It offers, nevertheless, advantages in terms of costs.

Acquisition funds, foreign currency, standing legislation and customs clearance are the main problems identified.

1 INTRODUCTION

We could approach the subject of subscribing to foreign periodicals in Brazilian university libraries from various points-of-view:

- the economic aspect, involving the relations among developed and developing societies and the question of technological dependence and import of information and know-how;
- the present role and status of library and information services in developing societies and
- the actual operational process of importing foreign library materials.

For works dealing with the first two aspects we would like to refer to LEMOS[1], MIRANDA[2] and the annual report of the INSTITUTO BRASILEIRO DE INFORMAÇÃO EM CIÊNCIA E TECNOLOGIA[3] (Brazilian Institute of Scientific and Technological Information).

The works of BARRETO & SOUZA[4] e CARVALHO & LEDA[5] present an overall view of the problems of acquisitions in Brazilian libraries. This paper will focus on the third point-of-view which is the process involved in subscribing to foreign journals for Brazilian federal university libraries, including the main standing legislation.

2 SUBSCRIBING TO FOREIGN JOURNALS: THE PROCESS, LEGISLATION AND PROBLEMS

2.1 Acquisition funds

Subscription of foreign journals in Brazilian university libraries can account for as much as 90% of the total acquisitions budget, specially in research oriented institutions. Providing and justifying this investiment is a major and recurrent task for librarians and university administration. Instability in the financial support of the library frequently causes unintentional interruptions in subscriptions and gaps in much needed collections that are only filled through interlibrary loan, often with foreign countries.

2.2 Foreign exchange

Present financial stringengy leads the federal administration to hard control of foreign exchange. Libraries receive each year their foreign exchange quota for the acquisition of foreign materials both in Brazil and for direct import of producing countries [6,7,8,9,10]. Before using their quotas, libraries must formally apply for permission. These applications are generally sent quarterly to the Ministry of Education and Culture. Monthly cummulative reports on the actual position of imports are also required.

2.3 Methods of acquisition

Formal bidding process is established by law[11,12,13] and is by far the most common method used in Brazilian libraries.

But the law also foresees special cases of exemption from bidding. Applicable to our situation are two of them:

- when acquisition is made directly from the foreign editor or exclusive commercial representative, either in Brazil or in the country of origin of materials and
- when acquisition is made through agents that are able to prove their well-known specialization in the field.

The latter case happens to be void, since various reputable agents are able to prove their competence and efficiency, making, therefore, formal bidding mandatory again.

So, legally, Brazilian libraries face two alternative methods for subscribing foreign peridicals:

- the use of agents, implying the bidding process and
- direct acquisition from the editor or exclusive commercial representative.

2.3.1 The use of agents and the bidding process

The simplest form of bidding involves at least three agents chosen freely by the library administration and summoned at least three days in advance by written correspondence. This applies to values not over Cr$ 4.276.724,00 (US$ 9,198.00) and is, thus, rarely relevant for the acquisition of foreign periodicals in a university library.

When higher values are at stake, the bidding process increases in complexity, including the requirements of public announcement and previous registration of agents which must prove their juridic, fiscal, financial and technical competence.

Once these formalities are fullfilled, the library chooses the most adequate agent in terms of price, quality and conditions of service.

In spite of all legal requirements, this is still the simplest form of acquisition and offers a series of operational advantagens. Using advanced technology, specialized teams and being exempted from the legal obligations concerning the foreign exchange remmittance to their countries of origin, foreign agents are able to offer a level of service unmachted by their counterparts in developing countries.

This method, though, has the disadvantage of being very expensive in relation to both the library funds and the foreign currency quotas, since the agents surtax can be as high as 200% above the journals coverprice.

2.3.2 Direct acquisition from the editor

The use of this method, specially in libraries subscribing to more than 300 titles, requires special personnel due to the great volume of correspondence and paperwork involved.

It includes

- the identification of journal titles, editors and prices, which requires an updated bibliographical apparatus existent only in larger university libraries,
- a special request to the head of the institution for granting exemption from bidding (see item 2.3.1)
- contact with the editors, one by one, ordering the pro-forma invoices,

- issue of individual bank checks or money orders for each editor,
- correspondence with each editor informing invoices payed and dates of payments and
- additional correspondence with practically all editors to clear up special problems that eventually appear during and subsequent to the subscription process.

At least one library[14,15] subscribing to more than 1,600 foreign journals uses this method which implies, in practical terms, the maintenance of a small subscription agency inside the acquisitions department. The most important advantage reported is an economy of about 35%[16] in acquisition funds. We would add two more: economy of about 50% in foreign exchange currency and employment of a larger team of librarians and administrative staff than if agents were used.

2.4 Payments

2.4.1 Payments in Brazil

When the bidding method is adopted and a Brazilian agency is whosen as the most suitable, payment is made in cruzeiros through Banco do Brasil S.A.. The agency must then provide for payments to the foreign editors or agents.

2.4.2 Payments to foreign agents or editors

Payments for foreign agencies or editors are also remitted through Banco do Brasil S.A.. Documents required for each transaction are

- a proforma invoice,
- a debit order and
- a statement of responsability, required by Banco Central do Brasil concerning the veracity, accuracy and legitimacy of the whole commercial transaction and documents involved[17].

2.5 Customs inspection and clearance

The majority of foreign journals reach Brazilian libraries through regular mail about three months after being dispatched from their countries of origin. Very important titles are ordered via air mail and take about one month to arrive at the libraries.

Some parcels, though, are subject to customs inspection[18,19]. In case of paper-printed materials a relatively simple to obtain document called Import Declaration is required prior to customs clearance. Other important library material, though, such as audiovisuals and magnetic tapes is subject to more strict regulations and its clearance requires at least the previous presentation of an Import Certificate issued by Banco do Brasil S. A.[20].

Between arrival in Brazil and customs clearance material is stored at the Empresa Brasileira de Correios e Telégrafos, the Brazilian post office, and storage taxes must be payed by the importing libraries.

2.6 Special problems

2.6.1 Import tax

Scientific and educational institutions are exempted from import tax[21,22].

2.6.2 Income tax

Invoice items refering to service or handling charges are considered wages payed to residents in foreign countries and are thus subject to income tax regulations. An income tax acquittance certificate or an exemption certificate are required in this case.

3 CONCLUSION

The difficult economic situation of the developing countries is certainly the main reason for the cumbersome governamental regulations regarding import of foreign library materials. There is no expectation that this situation will radically change in the near future allowing the streamlining of the whole process of subscribing to foreign journals in federal university libraries.

The step by step approach is, in our view, the most adequate in the pursuit of the objective of achieving real efficiency in subscribing to foreign journals. Brazilian government, through the National Program for Desbureaucratization,[23,24], is reponsive to initiatives calling attention to problems that can be solved by simplifying routines. The already cited administrative regulation issued by Banco Central do Brasil[25] which greatly simplifies import of foreign library materials, is an example of this cooperative effort. There is, thus, a big piece of responsability for each library in this process.

Libraries of the larger, research oriented institutions, where foreign information material is indispensable, are generally able to face the situation, finding their ways through the legislation and regulations intricacy and establishing routines as simple, efficient and cost advantageous as possible for acquiring foreign library materials.

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Problems of Acquisition of Overseas and Local Materials

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ABSTRACT

Against the backdrop of the Nigerian environment, the problems encountered by Third World university libraries in the acquisition of materials are highlighted. These problems stem from, among other factors, an undeveloped book industry, poor bibliographical control, dearth of basic infrastructures, and governmental measures aimed at conserving foreign exchange. An appeal to UNESCO to liberalize the issuance and distribution of its coupons and to the nations of the world to accord a special status to the generic book forms part of the solutions suggested for these problems.

PROBLEMS OF ACQUISITION OF OVERSEAS AND LOCAL MATERIALS

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INTRODUCTION

The approach taken in this paper has been pragmatic rather than research-or-theory-oriented - being therefore in keeping with the title of the Seminar: exchange of experience. If I had dipped into the literature, it is more to seek a confirmation of the experiences which I have narrated than to come by fresh information *per se* on the topic. At this point, let me hasten to state, in all modesty, that this is my twentieth year as a practising Nigerian academic librarian. It is to be hoped that the experiences I shall be highlighting, while reflecting an individual Nigerian situation will, to paraphrase Oyelese[1], illustrate some general obstacles with which the universal availability of publications in the larger context of the developing countries is fraught. This reaffirms Van Neils' views that "...despite the scattered location of the developing countries over the globe, their library problems show a remarkable unity of focus".[2]

Another limitation of this paper must be pointed out. Except in few isolated instances, gifts have not constituted a significant source for stock building in the libraries of developing countries - unlike their counterparts in the industrialized nations. The same can be said for acquisition by exchange: our libraries have either not been lucky enough to be fathered by institutions which generate publications of quality suitable for exchange purposes or else cannot afford the purchase of local materials which can be used in the alternative. Our discussions will, consequently, centre on acquisitions by purchase.

Perhaps at this point you will permit me to narrate a relatively recent incident. Even though the story is fairly long I hope its lesson will justify its telling. I had spent all of the 1981/82 academic year on sabbatical leave in Texas, U.S. Amongst my engagements, I used the occasion to collect some 2000 volumes of books, as gifts, for my library. Packaged in cartons, I posted these on 17, 18 and 19 June and again on 16 and 19 August 1982, (using the mail bag system). I had the assurance of the

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post-master that the consignment would be received in Jos in about six weeks' time.

While the books were being packaged in my apartment a fellow Nigerian had wondered whether my choice to mail rather than ship them was wise: they might be stolen in transit, he pointed out. I had argued that it would cost more to ship than to mail; that at the receiving end one had to travel the long distance of about 1000 kilometres from Jos to the seaport to take delivery of the shipment; and that the bother often encountered in getting the customs personnel to "clear" shipments, even if they were duty free educational materials, could be avoided.

In August, I returned to Jos and the books had not been received. On 9 November, about ten cartons (it was impossible to give an accurate number since the cartons were thoroughly squashed and their contents mixed up) of the June consignment were received. Of the remaining cartons I had to write to the local post office on 10 January 1983 inquiring after their whereabouts. Eighteen days later, the Post Office's reply was received advising that I should redirect my inquiry to the post office of despatch in Texas. I complied.

Then on 14 March 1983 (that is, seven months later) the bulk of the August shipment was received: Additional cartons arrived on 13 and 19 April 1983. Unfortunately, to date, about 37 of the original 45 cartons mailed in June are yet to be received!

The above narration only serves as the tip of the iceberg of the acquisition problems encountered by Third World librarians. Carroll and Thompson[3], Onadiran and Onadiran[4], Oyelese[5] and Ombu[6], Anyakora[7], Jegede[8], and Clarke[9], amongst others, have exhaustively addressed these problems which we would like to group under two broad headings: those having their origins in the library and those outside the control of the library.

INTERNAL OR LIBRARY BASED/GENERATED PROBLEMS

Internal problems centre largely on three elements, namely: personnel, facilities/resources, and procedures.

In regard to personnel, the common denominator of almost all the libraries in the developing countries has been the dearth of librarians, especially experienced ones. For example, in spite of Nigeria's population and

INTERNAL OR LIBRARY BASED/GENERATED PROBLEMS

her aggressive development programmes, she could not boast of up to 1000 librarians by 1982[10]. Of interest is also the fact that a significant proportion of our librarians had trained overseas. Lundu in a recent article had sought to assess the value to his country of the library education and training he obtained in both the U.S. and Britain. He concluded, "For a service-oriented profession that librarianship obviously is, knowledge of people, local conditions and special circumstances is extremely crucial if its practice is to be beneficial to any society"[11]. In a few words, we are saying that part of our acquisition problems arises from having librarians from the developing countries undertake their library education and training in the industrialized nations where unique Third World problems are not featured adequately in the curriculum of the library schools. Any wonder an expatriate librarian was to state recently: "The question I will try to answer is when you have learned all you can from the textbook, what are the special problems you will meet when handling acquisitions in West Africa...?[12]

Then, of course, is the question of the under-utilization or mis-use of some librarians in the acquisition process. One often wonders, for example, what the ideal qualifications of an acquisitions librarian should be. Could the holder of a first degree in physics and an MLS fill the post? And assuming the responsibility for materials selection is excluded from the schedule of duties of the acquisitions librarian, need a librarian still hold this position? If the contrary is the case, is he not by the nature of his physical location distanced from the teaching and research centres of the university to the extent selections by him may be tangential to the needs of the library patrons? In the University of Jos which is run on subject divisional lines, materials selection falls in the duty schedule of subject librarians who maintain very close association with the academic departments and the teaching faculty.[13]

Apart from the inconclusive debate as to whether materials selection is best carried out by the teaching faculty or the library personnel is the additional concern that must be focused on the subject background of the library staff. A 1982 study shows that about 46% of librarians in Nigeria majored in the humanities, 10% in library science, 16% in natural sciences, 12% in social sciences, 7% in education and roughly 2% in other disciplines.[14] This distribution suggests that materials selection by librarians in the "other disciplines" which include medicine and technology can, at the best, border on "trial and error". Add to this the fact that the majority of the teaching staff do not always cooperate with the library in the development of the library collection and you have a very unhealthy situation indeed.

It is but a statement of the obvious that many of our academic libraries, like their parent institutions, have had to begin operating from temporary makeshift premises. This arrangement naturally brings with it attendant constraints on the acquisition process. The need for adequate space for the receipt and processing of newly acquired items, for the housing of various bibliographic tools required for acquisitions work, and for the staff as they go about their tasks, remains one that has been solved satisfactorily by only a few libraries.

Beyond space, a number of libraries lack the necessary bibliographic tools to effectively carry on their tasks.

This may be the result of the limited knowledge of the staff, the difficulty in the procurement of the works or the sheer cost of them. Both the Library of Congress National Union Catalog and the British Museum Catalogue of Printed Books constitute a most welcome addition to the bibliographic arsenal of many a university library, but they must number pretty few Third World university libraries which can boast of the complete sets of these monumental publications.

And yet another problem which may be haunting libraries generally is what I have chosen to tag 'the numbers syndrome'. Meet many a librarian and the first greeting, upon introduction is invariably "How big is your library?" In order to quantitatively upgrade our collections in minimum time, some of us have employed measures such as blanket ordering, an arrangement I consider to be a luxury for Third World academic libraries which in view of their limited resources, should ensure that every cent of their book vote is judiciously spent.

Some basic library policies may also have adverse repercussions on the acquisition process and, indeed, can create considerable problems. For illustration, my library has decided to order new books along with their catalogue cards. However, in spite of repeated requests, our bookseller has failed to send the books and cards together. Consequently we have to find space for the retention of either the book or the cards pending the receipt of the other. And as if this was not enough problem, we have had instances when the Customs officials refused to allow our library to collect catalogue cards sent to us independent of their corresponding books. According to them, this is because the government had banned the importation into the country of greeting and similar cards, and as far as they are concerned cards are cards, be they for Christmas or for books!

Two more internal problems need to be underscored. The first relates to the issue of the number of copies of a given item, especially textbooks, which should be procured. This problem must be seen in the context of the underdeveloped nature of the libraries and the book industry in the developing nations, a subject about which more will be said later. The prevailing practice in our libraries appears to have been patterned after what obtains in the libraries of the industrialized countries where the book is part of the culture, the book trade is flourishing, the means of communications very good and the per capita income high. To the best of my knowledge, there has been no serious study of this subject and it would appear we shall all benefit if one were to be conducted.

Finally, there is a moral issue in which some acquisitions librarians find themselves mired in. While they subscribe to the need for global free flow of knowledge and information, they observe some correlation between the pattern of that flow and the current world economic order. It has mostly been a one way traffic. Accordingly, as they select materials in the social sciences, for example, they worry about the resultant effect of this unhealthy state of affairs which has led to the near-enslavement and pollution of the minds of our people and the debasement of our culture. Furthermore, it is feared that the almost total dependence of our libraries on the literature output of the industrialized nations would like in the prevailing economic arrangement, fasten us indefinitely as underdogs to the economic, cultural and technological apron strings of the industrialized nations.

EXTERNAL PROBLEMS

In the dichotomy of acquisition problems into internal and external, the sum total of the internal ones will be dwarfed when stood side by side with their external counterpart. We shall now discuss these external problems in the context of the institutions of which the library is part, the infrastructural facilities in our countries, the various relevant government laws and regulations, the state of the book industry, the relationship between the local and overseas materials supplier and the library, and some unique societal problems which may exist.

Institutional Problems

If a healthy materials acquisition programme presupposes the availability of adequate funding, it follows that an insufficient book budget will be a major impediment in the acquisition exercise. Given the level of the economy of the developing nations it is not surprising that the universities are under-funded and by progression, their libraries. In Nigeria, all Federal government-sponsored universities are, according to the National Universities

Commission* guidelines, expected to devote 5% of their total recurrent vote to the running of their libraries. Individual libraries, on the other hand, decide what percentage of this amount should go into the generic book procurement. Especially for beginning libraries, this figure has proved to be inadequate. My library, accordingly, had to remark in its annual report for 1977/78 as follows:

> "Attention need to be drawn to the fact that the expenditure on books and related materials totalled more than the library's entire recurrent vote for the year. It becomes clear, therefore, that the vote for the purchase of books and serials remains paltry and this situation must be redressed"

It is, of course, one thing to provide a given amount nominally as library vote and quite another to make the money physically available when and as needed. The fact remains that, in some institutions which have experienced major financial pressures, the library budget constitutes one of the first vulnerable ports of call. Cases have also been known where libraries have, ironically, been unable to exhaust their book funds. This is often the result of the inability of the given library to obtain the necessary foreign exchange to pay for its overseas acquisitions. In this regard, the facilitative measure introduced by the National Universities Commission in Nigeria in 1979 whereby Nigerian university libraries could use the foreign accounts maintained by their universities in four world capitals - London, Washington, Ottawa and Cairo - proved invaluable. But alas, the current oil glut and the global economic recession is forcing the termination of this most welcome arrangement.

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*A government agency responsible in general for the development of university education in Nigeria and in particular for the funding and overseeing of all federal government-owned universities.

Another issue of concern in the institutional context is the routine procedures in use in the ordering of all publications but especially the foreign ones. Many libraries are known to have fought it out with the university finance departments which as they design university-wide ordering procedures, have failed to take into account the peculiarities of the book trade.

Equally hurdle-like is the undue delay by the same finance department in the settlement of invoices (be they for second hand out-of-print works or not!). This situation made an expatriate librarian working in Nigeria once to state: "To transact business I discovered it is essential to follow your papers from desk to desk, from office to office. From this moment began my all too frequent visits to the Bursar's department".[15]

The Book Industry

De Benko's remarks in 1971 that "In the Anglophone countries of Sub-Sahara Africa, the book trade and publishing industries are gradually emerging... The book trade in the Francophone countries is in a desperately bad situation"[16] is updated, a decade later, by an editorial in Nigerian Libraries: "Unfortunately, collection development in Nigerian university libraries in the eighties, is still plagued by the same problems encountered in the 1950s"[17]

Oyelese informs us that of the materials ordered at the University of Ibadan library between July 1975 and June 1976, about 91.8% were ordered from Europe and North America and of the 7.2% from Africa, 6.2% were from Nigeria[18]. In an apparent attempt to explain this state of affairs, publisher Mitchell wrote, "The university market is the most difficult of all to publish for in Nigeria"[19]. Suffice it to add that the 1978 Spring issue of Library Trends was devoted solely, to "Publishing in the Third World" and it is not our intention to review it here.

We should instead register that expatriate multinational firms continue to dominate the publishing scene in our part of the world: only very recently have a few indigenous publishers, for example, Fourth Dimension Publishers, Enugu, Nigeria begin to make any noticeable impact. Even then, the printing of their publications is still done overseas. The state of our bookshops are no better. Crossey[20], De Benko[21] and Nwafor[22] have all written of their deplorable condition.

The implications of an undeveloped book industry vis-a-vis materials acquisition by our libraries are not difficult to see. We have to order from abroad most of our needs and in the process expend further that one commodity developing countries have least of and yet need so much -

foreign exchange. We have to seek and patronize overseas booksellers who have the capacity to handle university library-size orders. Describing the bookshops in Cotonou, Benin Republic, De Benko wrote: "Here, again, the transaction was strictly cash and carry as the owner-manager of the bookshop is not in a position to cope with the details of invoicing, completing customs declaration forms and complying with exportation procedures"[23].

Related to the problems identified above is the absence of some essential tools which facilitate materials acquisition. These include national bibliographies, book review journals and indexing and abstracting services. On book review journals, Nigerian author V. C. Ike recently stated, "One other thing I find woefully lacking in our country is informed literary criticism. Most books published are never reviewed. The few reviews that appear are often belated. Many omit essential details about the books and the reviews are no more than junior secondary school attempts at summarising the contents of the books".[24] On the other hand, some developing nations to this day do not have national bibliographies nor laws which make the deposit, at a central place, of all materials published in the country mandatory. Where the laws exist, as in the case of Nigeria, their enforcement has proved to be a formidable task as many publishers and printers fail to deposit copies of their publications. It goes without saying that no meaningful materials acquisition can take place in those countries without national bibliographies. The paradoxical situation then is that those of us from the Third World countries have access to information on the published output of the industrialized nations whereas we remain ignorant of what exists locally: by the time we get to learn of their availability, they are, in many cases, already out of stock! And yet the research value of Third World university libraries lies most in their success in the acquisition of local materials.

Infrastructural, Governmental and Social Problems

When we commented on the relevance of foreign library education for nationals of the developing nations, we were implying that the environment in which we practise librarianship has its uniqueness. Crossey underlined part of this uniqueness when he stated that the purpose of his book acquisition trip was "partly to buy publications in countries where we had experienced difficulty in doing any kind of business by mail"[25]. Another expatriate librarian narrating experiences in an African library wrote, "Colleagues in this country (Britain) might also think that a driver is something of a luxury. However, where telephone communications are non-existent and postal services leave much to be desired, I can assure you it is anything but a luxury."[26]

Consequently where these facilities are lacking or not functioning as efficiently as they should, our acquistion problems become all the more compounded. It means that responses to our orders may or indeed will, be late. It means that the efforts by us to purchase materials from the competitive second-hand book market will invariably be unsuccessful. It means that the 90-day credit limit allowed by foreign supply houses may not be received by the addressee before the expiration of the dateline. Yes, infrastructural problems do very seriously limit the scope and degree of our library operations. The persistent breakdown, for example, of the public power supply system may mean that the preparation of the order list on the electric typewriter simply has to wait!

In the early seventies, Nigerian seaports suffered an unusual congestion and library books, like other goods, had to take their turn "sleeping" on the shores or at mid-ocean. No amount of requests and pleading by librarians to the powers that were succeeded in earning priority treatment for library materials. And even at ordinary times, the bureaucracy associated with clearing of library consignments at the ports has proved an experience which many librarians would rather avoid. Hence, many prefer instead to have books mailed rather than shipped to them.

However, whether materials are sent by sea, air or surface mail there has never been a hundred percent assurance that they will not be pilfered in transit. Thus, bureaucracy, social ills and in any case the unwholesome attitude to work by a not an insignificant proportion of the citizenry have contributed in no small measure to complicating the procurement headaches of our acquisitions departments. A visitor to Rwanda captured the essence of what we are saying when he wrote in the following vein, "The foreign visitor to the ministerial offices in Kigali should note that many, if not most, of the offices have only a single hour per day set aside for 'audiences' for the public. During the rest of the working hours, the offices are closed to the tax-paying public with some 'exceptions'"27

But perhaps, by far, the worst problems encountered in oversea material acquisition come by way of the various economic and political measures taken, understandably, by the governments to conserve their foreign reserves. In Nigeria these measures range from the imposition of certain procedures involving, on the one hand, the use of the now notorious Form M for the purchase of foreign goods including books and on the other hand, the pre-shipment inspection (at port of shipment) of all goods destined for the country. Indeed at a stage, it became compulsory that all books ordered from abroad had to be insured in Nigeria. Then the use of pro-forma invoices was disallowed followed by a five percent tax on all imported books but this latter was recently rescinded. In an attempt to surmount some of these hurdles, librarians have had to use all sorts of platforms to pressurize government, but these moves, in almost all cases, proved unsuccessful. An example was the Seminar on Library Collection Development held under the auspices of the Nigerian Library Association at Enugu in October 1982. Part of the communique issued at the end of it reads:

> "While librarians appreciate the need to cortrol the inflow of foreign goods into the country through the use of Form M, they wish to point out that such a measure also usually brings about unnecessary delays in the settlement of oversea book bills...it is hereby suggested that the use of Form M be waived for libraries and bookshops... Also the 5% duty on books offends the UNESCO Charter; we suggest that this duty be waived for libraries..."

The Committee of University Librarians of Nigerian universities often working through either the Committee of Vice-Chancellors or the National Universities Commission has, as would be apparent from the minutes of its meetings, likewise attempted to get the government to reconsider some of its regulations which have strangulating effects on book importation. It should be acknowledged however, that it is not so much that the government does not appreciate the importance of foreign books in the development programme of the country; rather it is that faced with the choice between an ever dwindling foreign reserve and the purchase of oversea books, it has to identify with the lesser of two evils!

The Supplier

The point has already been made that because of the unsatisfactory state of our books industry, the bulk of the contents of our libraries is imported. While mutual efforts are made to maintain cordial relations between the foreign supplier and the local library, often the problems we have enumerated above constitute wedges in that relationship. To illustrate, the bookseller who allows his Third World customer the usual 90-day credit period may cease to smile if after the expiration of this period the bills remain unsettled - notwithstanding the very genuine afforts of the poor librarian to the contrary. Of course, some booksellers are very reasonable but once in a while one comes across few of them whose major attributes are neither patience nor tact. In 1978, for example, when the majority of Nigerian libraries were unable to renew their journal subscriptions, because of the country's stringent foreign exchange regulations, very few suppliers saw their customers through the period. A year later, things improved somewhat and one of our regular suppliers who had abandoned us wrote as follows: "...prior to the period of financial troubles in Nigeria, we were among the suppliers of books to your University library...and I am therefore writing to suggest that you might find it advantageous to make use of our services once more..." Our reply was not padded: "We have noted the new services you offer and if in due course we have need for them we would get in touch with you. Meanwhile, we continue to patronize the booksellers who stood by us during the period of financial troubles in Nigeria". It seems to me that some book dealers with business in the developing countries need to be educated on the peculiarities of the environment in which their customers function. Additionally, like in all business ventures, they must be prepared to take some risks: they cannot expect things to be in their favour all the time!

Still under the problems associated with suppliers, it has been observed that some booksellers charge what has been termed "Nigerian prices" for the titles supplied to Nigerian libraries. These are higher than the prices either appearing on the blurbs of the books or quoted in the trade bibliographies. Ombu additionally pointed out that because of the delay in settling oversea bills, "some agents add postal and handling charges to the actual cost of material purchased and refuse to give discounts under any circumstances, as a way of recouping some of the overhead expenses".[28]

Librarians and suppliers alike have been concerned with finding the best solution to the very long interval between placing an order and physically receiving the items. Accordingly the use of various shipping systems - mail bag, accelerated mail, parcel post, air freight, etc - has, at one time or the other been tried. What appears to be the latest in these efforts is the FAST (Foreign Airfreight Subscription Titles) system introduced by the periodicals subscription, Netherlands-based firm of Swets and Zeitlinger. Under this arrangement, the agent receives all journal issues as published, packs these in large consignments and air-freights same at regular intervals to the subcribing library. The advantages here include: the agent does the claiming of journal issues and therefore replaces those not received by the library. Besides, the airfreighting ensures prompt receipt of the items which may otherwise be held up in our inefficient postal system. However, the advantages claimed for the FAST system must be weighed against the cost of that service - 15% of the cost of the order.

It is relatively easy for the libraries in the industrialized nations to maintain a fairly accurate acquisitions encumbrance record: the advertised prices of the books they require are invariably the amount they pay for them. This is far from the practice in our part of the world. In few cases we are not able to locate information on the prices of the items we need and so we estimate. In other cases we place orders using the prices listed in the bibliographies. Even after allowing for the fluctuations in the foreign exchange market, one observes a significant difference between the prices on the order forms and those on the invoices, when the latter do finally arrive. Thus, even if we were to be using the computer in our acquisitions process, (which most of us do not), it would still be difficult to maintain an accurate record of our commitments. Of course the occasional "statements of account" sent by the booksellers are useful but the fact remains that one of the needling acquisition problems we have relates to our inability to state, at any given time, how much of our book budget is committed and how much is left.

To compound this problem, some university finance departments find it difficult to appreciate the librarians' headache that we have just identified above. In effect, the library's book budget which shows a credit balance at the end of the fiscal year may, in fact, be "in red" after allowing for unsatisfied orders and the margin of error on the estimated cost of those orders. The point, therefore, is that unless a rapport exists between the bursary and the library, not only will the "false" balance in the book budget be taken as true but the library stands the danger of having its book vote slashed, come the following year, on the ground that it was unable to use up the provision for the previous year!

OTHER PROBLEMS

To conclude this examination of our collection development constraints, we need to highlight briefly three other elements, namely (1) the unique problems relating to the acquisition of (a) local publications, and (b) AV materials and, (2) patron satisfaction.

Local Publications

The paradox has already been noted where the procurement of foreign publications is easier than that of their local counterparts. The University of Lagos Acquisitions Librarian confirms that "Government publications from developed countries... are easier to purchase for a Lagos library than trying to buy a Report of Committee on Location of Federal Capital of Nigeria from the Federal government printer in Lagos".[29] The enormous difficulties associated with the acquisition of local publications especially government publications have been ably documented in the literature[30,31,32]. The enacting of materials deposit laws by various governments should, ideally, have ensured that all the publications put out in our countries are bibliographically controlled and therefore easily accessible to libraries. It is a matter for regret, however, that even where the publications are faithfully assembled, the time lag between their deposit and their appearance in the national bibliographies has become such as to render the bibliographies useless, as selection tools,

The subject of the best way to procure locally published works by Nigerian university libraries has featured on a number of occasions at the deliberations of their head librarians. One suggestion was to have member libraries collect for themselves and other interested libraries, on request, all the publications emanating from the former's region.

At this point one or two comments are called for in relation to the acquisition of materials from fellow developing countries. This seems to be the most difficult areas to acquire materials from, even if such countries share a common boundary with yours. At the 1972 and 1978 SCAULWA[+] meetings in Lagos, Nigeria and Kinshasa, Zaire, respectively possible solutions to this problem were considered. The use of exchange of publications, advocated as a palliative, has not worked for reasons already stated. Only personal trips, even if financially very expensive, promise any solution - at least for the time being.

Reporting on the difficulty of acquiring materials from the Sudan, Crossey wrote: "...local publication is mainly a private affair arranged with a printer or bookseller. It is often very difficult for the university library to acquire

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[+] Standing Conference of African University Libraries, Western Area.

even single copies of Sudan central government documents. They even have to send a messenger to collect the newspapers issued by the Ministry of Information. I already know how impossible it was to get these mailed by the ministry.[33]

Non-Book Materials

While an increasing number of non-print materials find their way into the libraries of developing nations, the sum total of these number so few when contrasted with the holdings of comparable libraries elsewhere. Given the peculiarities of our environments, it is understandable that both their selection, acquisition and maximum utilization are often beset with problems.

Only recently have very few vendors of this category of materials set up shops in our parts of the world: as always we had depended on overseas-based agents. The difficulty associated with the location of the agents dealing on AV and other library materials made the University of Jos Library undertake the compilation of a Directory of Sources for Library Equipment and Materials in Nigeria, 1983, an admittedly ambitious project which predictably met with only a partial success. In any case, a good many of the AV softwares available are largely of peripheral interest to our patrons since they were prepared with foreign audiences in mind. We have to generate most of our AV softwares by ourselves preferably in our countries.

One other service or facility, I believe, many a library would be pleased to see in existence in our countries is a micro-reproduction centre which would film, among other things, the newspaper holdings of our libraries. The National Library of Nigeria is understood to be seriously considering the setting up of such a centre. Meanwhile the efforts in this direction of both CAMP* and the Swiss-based Inter Documentation Company, B.V.[34] are not only commendable but worthy of emulation.

Patron Satisfaction

No sensitive library can ignore the reaction of its patrons to the services it provides. Most times, these patrons will fail to take notice of the innumerable problems the library may be experiencing in an attempt to obtain much needed materials. Packman[35] relates an incident where, because of the vagaries of the postal system, for example, some lecturers who might have earlier received their own issues of journals to which the library also subscribed would storm the library citing the above situation to illustrate the incompetence of the library! Far in excess of the time spent by our opposite numbers in the industrialized nations, we have to devote a good deal of our time to the type of public relations activity necessary to educate our patrons on the unique problems we encounter in materials acquisition.

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* Cooperative Africana Microform Project created in 1963 to bring together in microform a collection of research materials related to Africa and based at the Centre for Research Libraries, Chicago, U.S.A.

Finally, in the words of Packman again "the real difficulties of working in Africa become more apparent in the research area. Quite clearly it is not possible here to assemble the vast collections of the past that are to be found in Europe or America."[36] Suffice it to add that our patrons are most unlikely to want to shower praises on us if the quality of the services we provide, because of the foregoing, falls far short of what some of them were used to while they were training overseas.

Oyelese provides us with a summary of the problems we have been discussing: "...the inability to obtain newly published selection tools promptly; the low level of availability within Nigeria of most of the required items; an undesirable time lag between ordering and receipt of items; the inability to obtain large orders of books on an approval basis; the difficulty to settle overseas invoices without undue delay; the failure to obtain many desirable second-hand books from overseas, and, last but not least, the impossibility to satisfy the urgent needs of library users."[37]

SUGGESTIONS

We have this far pinpointed the major acquisition problems facing our libraries while indicating at the same time that some of them are external to the library. For now we shall arrogate to ourselves the role of consultants to our libraries, our governments and our materials suppliers. In this capacity, we shall attempt some suggestions which, even if they do not solve all of our acquisition problems, will bring some amelioration.

First, it is observed that an increasing number of our librarians are undergoing their education and training in their home countries. This positive trend should be continued.

In countries where library schools do not exist, one should be set up or arrangements made to use training facilities of neighbouring countries.

Through visits to their customers *in situ* and extra efforts to appreciate their (the customers') unique problems, overseas book suppliers are bound to achieve greater understanding in their dealings with libraries from the Third World. The 90-day credit limit often stipulated for the settlement of invoices, we have seen, is simply unrealistic.

In our individual countries, we require to focus attention on a number of sectors. A conscious attempt should be made to upgrade the book industry, from the publisher to the printer to the bookseller. In this connection, the pioneering efforts of the annual Ife Book Fair in Nigeria is worthy of note. Simultaneously in those countries where the paraphernalia for effective bibliographic control are lacking, they sould be set up. The national bibliography is not only a necessity but conscious efforts must be made to publish it both regularly and on time.

Fourthly, we should begin to critically consider the advantages to be gained by automating some of the procedures in use in our libraries. The computer is already made an appearance in few campuses and one can see the advantages to be gained in using it in, for example, maintaining both our encumbrance records and making claims for the issues of journals not sent by the agents on time.

It seems to me, however, that the major thawing of our acquisition problems should take place at an international, rather than a local, platform. An agency such as UNESCO using all the facilities and connections at its disposal should work towards raising the awareness of the various nations to the uniqueness of the book and related materials as vehicles for the transmission of knowledge and continuation of human civilization. Accordingly books should cease to be treated as if they were boots and this fact should be pressed for inclusion in the laws of various nations. This is especially important, given the current global economic recession when some countries, in an apparent effort to save their economies, have begun to rescind the privileged status they had hitherto accorded to the generic book in their tax/import/export regulations.

Several nations of the world appreciate the need for, and subscribe to the international conventions which advocate, the free flow of information across international boundaries. Consequently, international action is called for, to not only remove any possible obstacles which impede the free flow of information but also to positively facilitate this flow. When libraries cannot pay for much needed items due to foreign exchange constraints, clearly the much advocated free access to information will be in serious jeopardy. The modest effort already made by UNESCO in this area by providing coupons with which libraries can purchase overseas materials is most welcome. Unfortunately only very few libraries, it would seem, come by these coupons. Many more of the coupons should be put into circulation and those companies and agencies presently reluctant to accept them in settlement of purchases should be persuaded to do so.

Finally, we have already underscored the agonisingly long periods between ordering and receiving materials, the shipment cost of such materials and the difficulties attendant on their clearance at the ports. It was the consensus at the Collection Development Seminar already referred to that the establishment of special air-freight rate for library materials will be a most welcome move. Mr. Packman shared this view though he phrased it somewhat differently "governments could provide an immense assistance to scientists and scholars overseas by establishing a concession rate, even a subsidized rate for air-mail postage on academic journals..."[38]. Clearly something has to be done and done urgently to solve our innumerable acquisition problems. And we can begin today to address the solutions.

Thank You.

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Collection Building and Information Services for Material in Special Categories Relevant to Third World use I:Agriculture

By

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COLLECTION BUILDING AND INFORMATION SERVICES FOR MATERIAL IN SPECIAL CATEGORIES RELEVANT TO THIRD WORLD USE I AGRICULTURE.

By

C.R. Namponya

ABSTRACT

Third world countries are modernising their agriculture and information is an important component in this process.

University libraries are main resource centres, and extend their services to all information seekers. They therefore collect as comprehensively as possible. Collection policies must be developed by library staff and clients.

Serials, non-conventional material and books are important in any agricultural library. Libraries must acquire high use journals backsets of less than fifteen years and rely on research station libraries and on obtaining photo copies. Hence a good collection of indexing and abstracting journals must be carefully selected.

Grey literature is difficult to access but important to developing countries. To trace it requires scanning almost everything from books, journals, accessions lists of other libraries, visits to government offices and writing to consultants and issuing bodies. Bibliographical control at national level and participation in international systems like AGRIS are necessary. Librarians must publicise this material and strengthen co-operative arrangements at national and regional levels. The paper suggests the production of agricultural information sources by libraries.

Selection of books follow similar line to the other materials but the role of local booksellers must be required. Selection of audio visual materials should also be borne in mind.

But all these materials are useless unless the information in them is brought to the attention of users by the development of information and reference services. Qualified staff are required and the paper makes a plea to international bodies to assist in education and training of third world librarians.

COLLECTION BUILDING AND INFORMATION SERVICES FOR MATERIAL IN SPECIAL CATEGORIES RELEVANT TO THIRD WORLD USE 1: AGRICULTURE.

Introduction

Some of the characteristics of third world countries are: low per capita income; high rural populations, low agricultural productivity, weak agricultural support institutions and high birth rates and therefore shrinking cultivable land. In the past, it was possible to meet food requirements by expanding the acreage under cultivation. Now a general rise in agricultural production can only be achieved by modernising agriculture.

Modernisation of a griculture needs the support of several services: seed multiplication, storage and distribution facilities, market institutions, transport and communication networks and adoption of modern technology. In the Neolithic Age when agriculture was discovered, man learned that he needed information and self discipline in his food gathering efforts. He learned for instance that seeds had to be selected and sown at certain times, plants had to be tended and protected and that harvesting had to be made and the food stored for future needs. The importance of information is evident here. The Treaty of Rome on the establishment of the European Common Market and the Second Rome Convention both cite information among other tools as important in the modernisation and improvement of agriculture.

2. Collecting Agricultural Literature

Agricultural libraries attached to universities are often better organised, better staffed and better equiped. Universities in the third world are neither ivory towers nor islands of privilege, but are part and parcel of their communities. In most third world countries, they are the main resource centres and their parent institutions are expected to conserve, disseminate and create new knowledge. The responsibilities of their libraries are therefore as much to the students and teachers as to external researchers and seekers after knowledge. Hence their services are often extended to anyone engaged in study or research. Such persons are allowed to consult reference books and journals at the library and may borrow books directly or by post. They will often be relied upon to provide information to government commissioned consultants and as at the Faculty of Agriculture and Veterinary Science at the University of Dar-es-Salaam, provide country-wide contents page photocopy service to all those engaged in agriculture. Most countries have no union catalogues and no union lists of periodicals. These libraries will therefore collect material ignorant of the holdings of other libraries in the country. They are expected to take a leading role in making the most effective use of available resources. The prerequisities to an effective library are a competent staff, well planned physical facilities, teachers who teach with books and an adequate collection of carefully selected and well organised books. With professors who teach with books and librarians who can co-operate with them in converting the library into an intellectual workshop, a handful of well chosen books may transform the lives of students. Collection building therefore depends on the availability of men, money and materials.

The first thing in building collections is to identify the clients, their needs, and educational levels. Then a collection policy, prepared jointly by the library staff and the clients has to be developed stating what materials must be acquired, the sources and methods to be used, how they are to be paid for and the levels and depth of coverage. The collections policy will attempt to maintain consistency in selection and remind both clients and library staff of their areas of responsibility. In its formulation, long term objectives of the institution and the strengths and weaknesses of nearby libraries must be kept in mind to allow for nationally co-ordinated services. Fussler[1] advocates that each library should have a collection policy.

Top officials have the first say in selecting materials by the amount of money they vote annually for the purchase of books and other library materials. The amount of money available determines what can be purchased. Libraries do not lend themselves to cost benefit analysis and when finances are hard to come by, the library is usually the first to suffer cuts. It requires constant battles between the Librarian and other officials for better financial allocations. Material selected must always be geared to the needs of clients. The best way to guarantee this is to ensure that library staff work closely with the teaching staff in collection building. No matter how qualified the library staff are, they will need to constantly seek the advice of their clients before selecting material. Nevertheless, recommendations from staff usually come in trickles and to build a balanced and active stock, library staff must have initiative and keep themselves informed about current publications, as well as out of print publications available on the market.

3. Serials

"The A.L.A. glossary of library terms defines a serial as a publication issued in successive parts, usually at regular intervals, and as a rule intended to be continued in definately. Serials include periodicals, annuals (reports, yearbooks etc) and memoirs, proceedings and transactions of societies"[3].

Serials are the main medium for the reporting of original research results and are the main regular reading of most researchers, teachers and students who look to them for up to date information on areas of their interest. Most of the researchers in the third world report their findings in well known international journals as the 'publish or perish' syndrome requires that they not only publish but that their articles must appear in respected journals. There is therefore a heavy reliance of third world scientists on outside serials. Nevertheless, local societies and associations, research stations and agricultural faculties publish results of their research in their own journals, research bulletins, annual reports or newsletters.

As library material a serial is a long term financial commitment and proper criteria must be applied in selecting it. Two things have to be considered: what titles are needed and how far back they should be acquired.

If funds permit, essential journals needed for teaching and research should be obtained with emphasis placed on the acquisition of high-use journals. Research done on actual use of serials indicates that in each field a relatively small number of core journals account for an overwhelming number of citations. Carl White[4] reported for instance that the National Library of Medicine in Washington found in an analysis of use which involved 4347 titles that 60% of the information was supplied by only 400 of the total. In the same work, he also reported that the Science Museum Library of South Kensington in England found that 350 serial publications accounted for 50% of the use of 82,632 and 1200 for 80%. As recent as the 1970s, Blaxter and Blaxter found that in some areas of Aberdeen, most scientists considered that they could keep up to date with the greater part of the literature in their field by scanning regularly some twelve journals and supplementing these by looking through current awareness journals like Current Contents and information passed on by colleagues. The reason for this is that scientists publish in prestigious journals. Lists of the core journals in agriculture have been made by Eugene Garfield[5], Lawani[6] and others and can be useful guides in selection core journals. Bibliographical tools like Ulrich's international period directory are also useful. So are serial holdings of libraries engaged in the same field. To maintain a systematic programme for serial selection, tools like New serial titles should be examined regularly.

Third world serials raise problems of their own. Firstly tracing them is difficult because of lack of publicity and signalling by secondary services. And they may be issued in limited print runs and stocks and therefore difficult to obtain. Or they may be behind in publication. For instance volume 44 No. 2, 1978 of the East African Angricultural and Forestry Journal was published in 1981. These may be traced in library accessions lists and national bibliographies and obtained through exchange with other libraries. Annual visits to publishers can be fruitful but too expensive for all but the few rich institutions. These visits can be substituted by letter writing to government departments, universities and research institutions and perusing publication's for advertisements.

In considering the acquisition of backsets of serials, it has to be remembered that incidence of use of serials older than fifteen years drops off sharply except for fields with great interest in taxonomy. University libraries may have to depend on the holdings of local agricultural research station libraries which are usually strong in back files of local and international serials. Library staff have to know the holdings of neighbouring libraries to avoid heavy duplication and work closely with clients to determine the most useful titles back copies of which should be acquired. Otherwise reliance must be placed on obtaining photocopies of articles.

Reliance an photocopies assumes that the articles can be traced. A good collection of the major indexing and obstracting journals is essential. Frauendorfer [8], and Buntrock[9] found that there were 700 agricultural abstracting and indexing journals, some with wide coverage but others treating narrow areas. However, there are four services available for agriculturists for the third world: Agrindex, The Abstracts on Tropical Agriculture and those issued by the Commonwealth Agricultural Bureaux (C.A.B.) and the Bibliography of Agriculture. It maybe advisable to take all the C.A.B. abstracting journals, and the Agrindex, and the Abstracts on Tropical Agriculture. Agrindex is the printed format of AGRIS, the international system for agricultural sciences which was started in 1975 to provide comprehensive coverage of agriculture literature using computer technology. Others have to selected with great care to avoid keeping expensive dust gathers. Commonwealth countries get most C.A.B. journals free as part of their quota; otherwise all secondary services have to be purchased.

Serials have to be acquired through an agent to minimise on dealing with too many publishers. Problems are usually those associated with delays in their receipt, and missing issues. For instance when dates of receipt of certain journals were compared between Bunda College of Agriculture in Malawi and the Tropical Products Institute in England, it was found that the difference in receipt could be as long as three months with the former worse off[10]. Claims are usually too early or too late to be attended to.

Grey Literature

Among the diversity of agricultural literature this group which is usually not available through booksellers consists of reports, conference proceedings, translations, magazines and theses. This literature is notorious for its inaccessibility and yet maybe the most important to developing countries. Accessibility is difficult because although it is printed, it is not published by its originators because of lack of funds. It is therefore issued in limited quantities. In the developing countries, this literature maybe the only source of up to date and useful information.

Selection implies rejection of what is not relevant but most third world university libraries because they are the only organised resource centres would have to collect almost everything pertaining to their countries. The major problem is to identify or trace the material a considerable body of which is known to lurk in files in various offices. A high proportion of this literature is a result of special studies, and study tours. To trace it requires scanning almost everything from books, periodicals, accessions lists, and reports of libraries. Most often one does not know whether it is available for purchase. A sum of money should therefore be set aside in case an invoice is sent with it. Other useful methods for tracing this material is to visit government offices, contacting fellow professionals as well as researchers, to write to consultants, to attend conferences for contacts and generally to have an "ear" for material. It maybe useful for librarians to make visits to originating institutions to plead with them to be less restrictive and to produce as many copies as possible for wider distribution.

An interesting and useful work is done by the International Livestock Centre for Africa (ILCA) which is based in Ethiopia. With funds from the International Development Research Council of Canada it has paid visits to various African countries to identify and microfilm reports and other non-conventional forms on livestock not captured by bibliographic data bases. Catalogues of these materials are published by country after the documents have been catalogued, indexed and given an indicative abstract. The information is entered into a computer to form a specialised data base which is freely available to researchers in Africa. The collaborating institutions of every country where the exercise took place get microfiche copies of the documents microfilmed together with a microfiche reader/printer where necessary. This demonstration of the control of literature benefits both ILCA and the countries visited. As part of the project component, a start has been made to collect similar literature on agroforestry for the International Council for Research in Agroforestry (ICRAF) based in Nairobi, Kenya. These attempts at bibliographical control of this material give a chance for African librarians to select material useful to their clients.

The best well known bibliographical control of grey literature produced in the developing countries is that by the The International Information system for the Agricultural Sciences and Technology (AGRIS.) Its output is AGRINDEX, and about 16 per cent of the literature it handles is grey literature. Access to the literature included in Agrindex is through the originating organisations usually marked by asterisk in the entry. It therefore follows that the best way to organise this literature is to begin at the national level. Adoption of the concepts of University Bibliographic Control (UBC) and Unversal Availability of Publications (UAP) can assist a great deal in making universally and rapidly available basic bibliographic data on the publications issued in developing countries. The concept of UBC is complementary the efforts of AGRIS at bibliographically controlling the literature produced in developing countries. Unfortunately, there are still a number of African countries that are not yet AGRIS participants. IFLA has been at the forefront of the development of UBC while the FAO has spearheaded AGRIS. Both IFLA and FAO should work closely with developing countries to assist in controlling the literature produced but which may not be published and made widely available. A number of countries have established agricultural documentation centres to collect and disseminate information contained in grey literature and those that have not yet done so should be given every assistance.

Grey literature from other developing countries maybe obtained through exchange arrangements. They maybe traced through accessions lists and catalogues. Librarians have to publicise material produced in their countries through their accessions lists and by making such material available to international data bases and therefore known and made available to a wider audience. There is need to strengthen co-operative arrangements between libraries in different countries to alleviate the problems posed by fugitive literature and service better national programmes. Co-operative arrangements based on coordinated groups of libraries in a region enable the cooperating libraries to assign responsibilities, to create accessible depositories, to identify existence of material and to extend privileges. There is a need to strengthen communication between librarians at national and regional levels and between librarians and researchers in order to strengthen the acquisition of grey literature in third world University libraries. The later should produce directories of agricultural information sources which must include grey literature. Exchange arrangements are the best method for obtaining university publications, government reports, conference proceedings, research reports and other non-conventional material and must be encouraged.

Most third world countries have invested a lot of money in post graduate education of their nationals. Most of these conduct research on their countries' problems and compile this information in theses and dissertations. Theses produced overseas can be traced through Dissertation Abstracts and the Aslib Index to Theses. But early contacts with universities and research students can speed up their tracing and acquisition.

Most British universities for instance will require authorization from the author before they can release a copy and these contacts can be useful at the acquisition stage.

Theses presented in the third world may not be listed in any of the bibliographical tools above; university calendars, acquisition lists and other publications have therefore to be combed systematically. Contacts with the university departments will also be useful.

Books

It has been estimated by the Centre for Library and Information Management at Loughborough University that the average book prices trebled in real terms since 1974. The average prices for agriculture and geology in England are £19.00 and £25.95 respectively. Since most third world countries depend for their book supplies on the United States and Europe, the effect of the rising book prices for the student is that he cannot be able to purchase books and must rely on the library for his basic textbooks. But everywhere book votes are declining in real terms, thereby reducing the number of titles that can be purchased. Prudent book selection policies are therefore the rule rather than the exception.

The principles to be followed in selecting the books are not be very different from those dealt with above. Up to dateness is very important with emphasis on the classics in each field regardless of age. Some books loose their up to dateness very rapidly as the information they contain may be dangerous because it has been proved wrong.

Specially prepared lists of books in various subject fields are available and these have to be perused by both users and library staff. Publishers' prospectuses, journals and other publications have to be systematically examined for new material.

But sometimes talking of selection in the third world can be a dangerous thing. Any librarian will acknowledge the indirect role played by local booksellers and publishers in building book collections. Their prominence is heightened by the lack of foreign exchange, the absence of book promotions, the long wait for books ordered to arrive and the absence of book reviewing media. Where they exist, these can account for quantities of purchases. This reminds one of the volunteer worker's explanation of why some of her friends were picking local husbands while in the third world; because of availability, she said. The need for resources to keep research and teaching programmes from being starved, the need to keep alive combined selection efforts alive argue favourably for subordinating ready availability to methodical selection of materials to stop the clamour for essential books. Visits to them can unearth a lot of useful materials.

Selection of material from local book shops and booksellers has to be a short term solution till the pressure for essential resources lets up; otherwise methodically prepared lists of desiderata for purchase have to include known standard works which can be traced from such bibliographical tools as those by Blanchard[12], Bush[13] Lendvay[14] Lilley[15] and Vallentine[16] .

5. Other Materials.

The library has an obligation to acquire audio visual materials. When used properly, films, video-tapes etc can be essential teaching aids. They enable students to watch procedures many times in order to understand them thoroughly. A lot of material is produced locally mainly for farmers but international bodies have taken an interest in producing slides, films and video for use in teaching. It is incumbent on library staff to trace this material and acquire it for a wider audience. A collection policy for them has to be developed.

6. Information Services

There is now a new concept of the functions of a library which acknowledges that available information has to be provided to users without their having asked for it. The development of collection policies assume that there are users who have to be notified of the existence of the materials on their arrival User education programmes, publication of lists of accessions, bibliographies both topical and retrospective, circulation of materials displays and selective dissemination of information all help to bring new materials to the attention of clients.

Information has to be provided to them to "answer the problems encountered in their daily routines, to gain awareness of the current developments in their field all over the world, to review the results of all investigations previously made on the subject being studied, to find information about current trends of investigations, the possibilities of developments and to browse in related fields as well as new or fields different from their own" 17. Service - oriented libraries justify their existence. A prelude to this of course is the bibliographical control of local materials and improvement of access to it. Eager and competent staff are needed to assist students, teachers and other clients to use the library materials effectively. They are required to examine all materials received for papers of interest to their clients, to provide reference services, easier access to literature and liberal use of collections. The actual number of materials held may not be great, but it is the amount of information obtained from them that matter.

In the past far too much staff was spent on cataloguing and classification and materials were unavailable to users for long periods while the staff decided on classification numbers. Staff contacts with clients were thereby reduced and both users and the library were worse off as a result. There is movement away from this tendency all over the world and some of the rich libraries in the third world have adopted computers to provide selective dissemination of information and other services.

The need for high calibre staff in the libraries is evident as it is futile to provide books and other materials without the staff to help exploit them. There is a tendency in the third world to put the need for qualified staff at the bottom of the list and yet they are badly needed to develop collection policies, plan services, and to sift through the existing mass of local and outside publications and bring those likely to be useful to the attention of clients.

The earliest evidence of the recognition of the value of engaging qualified staff was the appointment of Rüland in 1850 as a full time librarian by the Würzburg University here in the Federal Republic of Germany. What an appropriate place for us to gather from all over the world and to make a plea especially to the international bodies for assistance in training and education of staff for third world libraries!

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Collection Building and Information Services for Material in Medicine Relevant to Asean Countries

by

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ABSTRACT

UTHAI DHUTIYABHODHI (THAILAND). Collection Building and Information Services for Material in Medicine Relevant to Asean Countries.

This paper deals with the history of medical librarianship in Asean countries, Indonesia, Malaysia, the Philippines, Singapore and Thailand stating about the role of libraries in providing the needed material and service established. Some of the problems faced by the libraries are also mentioned. Organizations which are contributing towards the development of library network are stated.

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INTRODUCTION

The "information explosion" has made medical doctor, general practitioner or specialist aware that it is becoming more and more difficult to keep abreast of new publication. So medical libraries have a very heavy responsibility indeed. In order to serve its institution, they must have purpose and direction. Librarians should be aware of the institution's philosophy, goals, programmes, practical activities and their developments. They must find the ways and means to collect and handle effectively the information generated all over the world.

NEW TECHNOLOGY

Modern technology comprising computer services, photocopiers, microforms, and other reprographic equipment, telecommunication devices, audiovisual media have revolutionized the running of the libraries. These technological developments gave a new dimension to the information concept. New technologies have been developed from experimental stage to operational stage.

Various national and international information systems have been established and are being for generation and retrieval of information and information transfer.

It is because of these developments and technical facilities, users have been forced to change their approach to acquiring information. They have to adopt to an entirely new situation.

In the olden days, users could keep themselves by reading books and journals. At present, they have to depend on retrospective literature searches, selective dissemination of information and copies of original documents. So users have to know of their existence, and how it is provided.

BACKGROUND

Medical libraries in Asean countries have largely developed along with various institutions. The five Asean countries namely Indonesia, Malaysia, Philippines, Singapore and Thailand have a long history of medical librarianship.

It is agreed that the best developed medical libraries in Asean countries are to be found in the medical schools. They are better endowed than other types. The more advanced technologies such as computerized information can adopt to manage in this type of the libraries.

Medical libraries can also be found in general hospitals, district hospitals, government health ministries and departments, pharmaceutical and drug firms and other health related bureaus.

In Asean countries medical literature and information services are not equally accessible to all medical practitioners. Those attached to medical schools, research institutions, and some of the larger hospitals have easy access to medical information, while other medical practitioners in non-teaching hospitals and remote areas have little access to resources.

Good information resources and information services are very important to the medical practitioners, and may be directly related to patient welfare. We shall now consider the situation of the medical libraries in Asean countries.

INDONESIA

Most medical school libraries are usually separate libraries under the Dean of the medical school rather than a part of the whole university library system.

Medical libraries in the University of Indonesia is in Jarkata, Airlangga University is in Surabaya and Diponegoro University is in

Semarang, they all subscribe to journals, but below the minimun 500 title subscription of the American standard. In building up the collection, the teaching staff helped to select materials. Books are mostly in English, lectures and exams are in Indonesian. Barriers of language are very great. Audio-visual material collections are to be purchased only after the librarians are convinced that the psychological aspect of the users is known. (1)

Several medical libraries outside the medical school libraries try to build their collections toward what they should be.

Private medical schools are numerous in Indonesia.

Activities rendered to users are MEDLARS/MEDLINE search, photocopies, indexing of locally produceed periodical literature, accessions list and interlibrary loan. The photocopy service given free by SEAMIC is very much welcome by research workers and the teaching staff.

"Student loan libraries" have been established with WHO support, the loan period is only three months, but borrowing is free.

One of the efforts to provide information to users in the field is the sending of book packages from the Ministry of Health to health centres. A project for bibliographic control of health literature is planned.

Bibliographic already been prepared are as follows:- Directory of Health and Medical Libraries in Indonesia, Directory of National Health and Medical Research and Publication Institutions, Union List of Health and Medical Journals, Bibliography of National Health and Medical Research Reports, Bibliography of Ministry of Health's Publications, Cummulated Index of National Health and Medical Journals (1970-1980) and Cummulated Index of National Health and Medical Seminar Proceedings (1970-1980) (2)

Cooperation service is the trend nowadays in Indonesia.

MALAYSIA

In Malaysia medical library services started with the establishment of the Institute for Medical Research in the year 1900. It has gained world wide recognition as an outstanding institution for research in tropical disease. The medical library of the University of Malaya, the medical library of the University Kebangsaan Malaysia (National University of Malaysia) and most recent medical library of the Universiti Sains Malaysia (Science Univerity of Malaysia) which is located on the northern Island of Penang join forces to form the major medical libraries serving the medical field.

An attempt at resource sharing was undertaken by the medical libraries of the University of Malaya, the National University of Malaysia, and the Science University of Malaysia which hopefully will increase the number of journal titles available in the country.

The deveolpment of library resources is an attempt towards a more comprehensive holdings of journal backsets through the establishment of journals in microform, The library budget is devoted towards the acquisition of backsets to fill up the gaps in the collection.

Government publications could be obtained directly from the Statistics Department or through booksellers

There is also a more significant development in the area of audio-visual resources both for self-study at undergraduate level as well as for continuing education of practising medical and health personnel.

Services available in the major libraries are as follows: Information service to the clientele of the library. Both manual searching of the Index Medicus, Excerpta Medica and other indexing book are available to users. MEDLARS search is made available through the Southeast Asian Medical Information Center (SEAMIC) as well as World Health Organization (WHO/SEARO). Some kind of indexing is carried out in all the major libraries, the activity ranges from the indexing of materials of local interest published in the country or overseas, which in cooperation with the medical library, National University of Singapore will result in the Bibliomed Sm and its supplements.

Major bibliographies in the areas of special interest, like traditional medicine, medical education, are published.

Photocopying facilities can be in the form of photocopies obtained from SEAMIC, WHO or the Australian National University.

Interlibrary loan is chanelled between these major libraries. To aid interlibrary-loan cooperation, a union list of medical and health related periodicals holdings of the three medical school libraries is in the process of being up dated and published. A more comprehensive Union List of Periodicals in all subject areas available in the country is being produced through the computerized PERPUNET project of the Science University.(3)

PHILIPPINES

In the Philippines, the Health Sciences Center is a newly established autonomous unit of the University of the Philippines. The Health Sciences Center consists of the College of Medicine, Nursing, Pharmacy, Dentistry, Institute of Public Health, Ophthalmology Health Sciences in Tacloban, Philippine General Hospital, Postgraduated School of Medicine, School of Allied Medical Profession, Community Health Program, Anesthesiology Center for Western Pacific and the National Teacher Training Center for the Health Professions. The center contributes to the improverment of the health of the Filipino people in response to their needs and aspirations.

Acquisitions are restricted by lack of foreign currency. The number of periodicals subscribed is declining in some institutions due to the constant sharp price increases in this sector.

The method to obtain the government publications in Philippines, it was best to write directly to the Secretary of the Department concerned.

Service of the library is to disseminate information to library users. Indexing service which already published is Philippine Index Medicus, a retrospective author-subject index to Philippine medical literature found in the University of the Philippines from 1917-1976, Since 1977, this index has been incorporated in the Index to Philippine Periodicals. To improve its services to the country in general, the U.P. Library System decided to use the computer as a tool in producing the Filipiniana Serials currently housed in the 42 unit libraries as of May 1980. The Union Checklist of Current Serials Holdings in the Health Science, 1976 and Union Checklist of the Foreign Serials Holdings of the University of the Philippines Libraries, 1980. (4)

Photocopies are provided to outside requesters against payment. Few requests seem to be made to foreign sources. Numerous bibliographies activities are carried on. The Institute of Public Health, University of the Philippines, collecting and listing the domestic fugitive literature on medical and health - related topics.

SINGAPORE

The medical library of the University of Singapore is the only medical library in the country for the use of not only university staff but also research workers and medical practitioners the amount of biomedical information resources is not sufficient. It has a collection of approximately 90,000 volumes with over 1,000 current periodicals and audiovisuals materials like slides, videocassetts and microfilms.

The library does its own book selection, cataloguing, classification, book repairs, staff training, except for the placing of the book orders which is done in the central library. All the relevant textbooks on subjects taught in the faculty care has also been taken to develop a good reference section with the major indexes, bibliographies, abstracting journals and other publications which may help the teaching staff in their teaching and research programmes.

Other materials in the library's collection are pamphlets reprints, and equipment catalogues.(5)

Reference service is offered to all users. Requests for the compilation of bibliographies comes from both the teaching staff and personnel in the government departments. This is carried out either by using resources available in the library, or with the assistance of the MEDLARS Services provided by SEAMIC in Tokyo or the Australian National Library in Canberra. Photo-Coyping service is provided for all users. Articles not available in the library will request through SEAMIC. All articles of local interest published in Singapore or overseas are indexed and have been published by SEAMIC in the Biblio-Med SM and its supplements. (6)

The library also contributed a section to the International Bibliography of Social Gerontology published by the International Center of Social

Gerontology in Paris; this will be updated every two to three years, and auother publication is Cancer Incidence in Singapore, published by the IARC. A computer print out of a Checklist of Current Singapore Periodicals in the Medical and Health Sciences for WHO union list covering the Western Pacific has been done in 1982. (7)

The library is also interested in developing a computerized house keeping system. The computer centre of the University is available to the library. It is now use the Minisis software package developed by IDRC for such technical functions as acquisitions and cataloguing.

The International Development Research Centre (IDRC) is on of the few development assistance organizations to have a programme and budget specifically devoted to information matters. Its Regional office in Singapore works closely with the University of Singapore. IDRC is very interested in promoting health information systems in the region. In the future, IDRC might be prepared to support the compilation of regional medical literature index through the use of the MINISIS software, by providing access to their SALUS data base.

THAILAND

Medical libraries can be divided into University, Government and autonomous bodies. The university medical libraries are the best equipped libraries in the country. There are seven medical school libraries, four are located in Bangkok, the other three are located in the provincial. The first medical school is library Division (formerly Siriraj Medical Library) of Mahidol University, Chulalongkorn Medical School library of Chulalongkorn University is the second largest medical library, Chaiangmai Medical School Library of Chiangmai University is the first medical school library outside of Bangkok, located in the northern part. Ramathibodi Hospital Medical School Library of Mahidol University was established in 1969. Khon Kaen Medical School Library of Khon Kaen University located in the Northeast. Prince Songkhla Medical School Library located in the Southern part, and the latest one is Pramongkutklao College of Medicine Library. The University Medical Libraries are well organized providing many facilities and services which other types of medical libraries do not offer. Services offered include the following: Aid in finding materials, help in securing answers to reference queries, preparation of bibliographies, securing of photocopies of articles not available in the collection, instruction in the use of library materials, compiling new accession lists, current awareness service (CAS) MEDLARS search through SEAMIC and WHO. Most of the requests have been received from university clientele.

Among the university medical libraries, library Division (Siriraj Medical Library) stands out to be the most complete collection of books and periodicals serves the needs of a large number of medical practitioners, both in the university and outside the university by compiling bibliographies and sent photocopies to the requesters. The library contains approximately 90,000 volumes and subscribes about 600 foreign journals. This library is acting as a book depot and MEDLARS Key Station for SEAMIC. According to a workshop on National meetings for the establishment of Health Literature, Library and Information Services (HELLIS) Network in Thailand in 1980, the library was designated to be the National Focal Point.

The library Division, Mahidol University has produced Bibliography of bibliographical Books Catalogued, Cancer Bibliography, Bibliography of Population and Family Planning, Tuberculosis Bibliography Bibliography of Gastrointestinal Diseases, Catalogue of Scientific Serials in Mahidol University, and Union List of Serials in Medicine and Health Science Libraries in Thailand (1983) a computer print out of "Union List of Serials in Mahidol University" will be expected to come out in 1983.

Cooperation among medical libraries in Thailand will strengthen the compilation and production of comprehensive subject bibliographies and indexes so as to meet the needs of researchers in this field.

USERS

The users of medical libraries varies with the type of library and the instituiton or organization supporting it. Users come to libraries for a variety of purposes and for different purposes at different times: to use study facilities, consult and borrow materials, get answers to questions, solve problems, keep up with new advances, and review the literature. They come more frequently when access is convenient and initial experience in finding what they want is successful.

A profile of the users of information in medical libraries can roughly be divided into two groups as mentioned below:

Medical users: Undergraduate students, Graduate students, Postgraduated students, Teaching staff that comprise qualified medical dental and nursing staff, Research staff, Paramedical and Technical staff, Doctors, Dentists, Nurses and Pharmacists.

Non medical users: Administrative staff in medical schools and Hospitals, Secretaries, Managers,and Planners.

The useful type of information service for users is a appropriate technology information dissemination program which includes the collection of relevant information plus translating service whenever necessary as well as technical back up to analyze, and repackage information to suit situations and need of users.

COLLECTIONS

Most medical libraries need to provide up to date information, the collection held should be such as to enable it to fulfil this role. The journal literature is, therefore, of prime importance as it is the method whereby new knowledge is imported as quickly as possible in a brief and usable form.

Materials available in medical libraries include Journals and Serials, Books, Monographs, Reference Materials, Report Literature and Proceedings, Statistical Publications, Bibliographical materials, Audiovisual and Microforms.

Possible sources of books and journals for medical and health science libraries in Asean countries are :

1. Local sellers of imported books.
2. Direct import against Import Licence.
3. Gifts from bileteral and international agencies, like British Council, SEAMIC, WHO etc.
4. Exchanges within its institution or other institutions.

Direct import of publications is not always possible because there is the problem of foreign currencies, the publishers appear to be loss interested in supply direct to libraries who are the actual users, for commercial reasons. Advance payment is a problem. Direct purchase of overseas publications is a complex process, requiring contact with banks and knowledge of customs and exchange regulations. Lack of funds and trained staff in Asean countries limit the accessibility of the available medical information sources.

Periodical literature stimulate their readers and provides the most recent information. However, in Asean Countries it takes two to three months for medical libraries to receive journals from overseas, and it is often impossible to claim for missing issues as publishers require claims to be made within a time limit. Besides this there is problem of an increasing cost of journals and the difficulty of obtaining back issues.

Budgets for journal acquisition are usually approvel for only one year. The problem of finances is particularly acute in some Asean countries, which makes it difficult to raise their libraries to the level of the accepted standards. The rising cost of journal subscriptions, amplified by inflation, all these factors discourage the librarian from placing journal subscriptions.

Owing to the lack of money, exchange has always been a major source of material for some libraries. The library often exchanges a periodical produced within its institution for journals of other institutions. Several duplicate exchange schemes exist, and are especially useful to medical libraries.

In Asean Countries there is a wealth of journal articles published. Nearly all the original research pertaining to indigenous problems are found in these journals. This valuable national collection should be indexed exhaustively.

Indexing and abstracting publications are so important and also expensive, but access to bibliographical sources is essential for professional level medical library work. The librarian of a medical school in Asean countries will buy first the indexes and abstract journals. Biological Abstracts, Chemical Abstracts, Excerpta Medica, Index Medicus, Science Citation Index and Tropical Diseases Bulletin are the most popular and best-known indexing - abstracting tools. Only the bigger libraries can afford to maintain subscriptions to these services.

However, the trial issue of the Index Medicus for WHO South East Asia Region (formerly indicated as "Index to South East Asian Health Literature") has been compiled by the Regional Office, New Delhi, in collaboration with the National HELLIS focal points, are expected to be available by early 1983

Following the indexes and abstract journals, monographs and textbooks are important sources of information. A major problem of book purchase is bibliographic control, national bibliographies are often incomplete and out of date, while catalogs take months to arrive from overseas. Book selection in some Asean countries are dependent on catalogues and reviews, and sometimes librarians have no opportunity to examine the books before purchase.

Government reports, theses and conference papers are necessary in the medical library, but patience and ingenuity are needed to acquire them. The collection of reports and unpublished material is restricted to the libraries that specialize in a subject area. "Student loan libraries" have been established with WHO support since 1974. WHO documents are also acquired by medical libraries. Medical textbooks witten by nationals are very few.

There is tremendous potential of audiovisual media in the biomedical sciences. The medical library of the future should be as actively concerned with audiovisual materials as with the printed words. Audiovisual materials cover a complex variety of medicine and techniques and in larger centres specialized staff handle both the technical and programme planning aspects. (10)

The value of audiovisual materials for teaching purposes is being recognized by medical schools in Asean countries. Most medical libraries have acquired audiovisual materials in the form of slides, videocassetts and microfiches. Collection of audio-visual materials depends on what is currently available on the market. The selection of slides, video-cassetts or films should relate to and directly support the teaching curriculum.

TECHNICAL PROCESSING AND MAINTENANCE

In order to make materials that have been acquired to be used effectively, they must be properly classified and catalogued. The National Library of Medicine (NLM) Classification and the Medical Subject Headings (MeSH) are used by most medical libraries in Asean countries. The NLM Classification, is sometimes not applicable to local collections and conditions. However, it is the only medical scheme with regular revisions.

INFORMATION SERVICES

A good library is judged not only by the size of its collection, but also by the quality of services offered to satisfy the needs of its users. Services that are available in some institutions include current awareness, subject bibliographies, copy reproduction, inter-library loan and translations.

Most medical libraries in Asean countries issue Newsletter informing the users of new acquisitions.

Backup services, such as the provision of photocopies, obtaining material not available in the library from other libraries on inter-library loan, and translation facilities are improtant for meeting the needs of users. MEDLARS/MEDLINE service provided by the National Library of Australia, WHO, and SEAMIC is being used by Asean countries.

The copying machines have had a tremendous impact on library use are well distributed in most medical libraries.

It is indeed true that in today's world of information explosion, no one library can stand alone. To stand alone is to stand on the losing end, therefore the librarian should keep in mind that all aspects of planning should be done with the ultimate view of the library becoming a part of a consortium or network of libraries sharing their resources with each other.

NETWORK

Networking is now become a major concern in Asean countries. A network in the context of medical library is a cooperative effort among the libraries for resource-sharing and having access to literature of other libraries, within the country, within the region and then to the libraries and literature of interregional or international libraries.

The concept of library network, is a specialized type of library cooperation for centralised development of cooperative programmes of services and resource sharing based on the principle of best utilization and economy.

The following organizations played an important role in the development of cooperation.

WHO

WHO/SEARO HELLIS Network. Hellis is the acronym for Health Literature, Library and Information Services Network covering the eleven countries of the WHO Southeast Asia Region, : Bangladesh, Bhutan, Burma, DPR Korea, India, Indonesia, Maldives, Nepal, Sri Lanka and Thailand.

In 1976, the Regional Advisory Committee for Medical Research in Southeast Asia Region of WHO recognizing the need for scientific information by research workers recommended that a mechanism be developed whereby all research workers in the Region will have access to the health literature they require. The Southeast Asia Regional Committee of WHO at its meeting in 1978 followed this up and recommended that a network of health science libraries be set up to provide health literature and information service in the countries of the region.

In 1979, SEARO organized an inter-country consultation meeting of senior librarians, administrators and users of libraries to discuss the feasibility of establishing a resource-sharing network of libraries in the Region. The basic concept behind HELLIS is that of resource sharing. Resource sharing will be done through networks utilizing the available resources to the maximum extent.

The objectives of HELLIS Network is to make better use of

1. the existing resources in the country
2. the information resources in other countries of the region
3. the information resources in other regions.

Directly, after the 1979 meeting, all participating countries were required to hold national HELLIS meetings and designated their focal points. SEARO offered technical and financial support for holdings their meetings.

HELLIS national networks have been formed in seven countries of the Souteast Asia region, Bangladesh, Burma, India, Indonesia, Nepal, Sri Lanka, and Thailand, and national focal points have been designated. (11)

HELLIS has been able to carry out the following activities:-

1. Established HELLIS Networks in seven countries of the region,
2. First and second regional workshops on health Science Library network management has been held on 10-21 August 1981 and 10-20 August 1982
3. First Workshop on MeSH indexing of health literature was held on 3-14 August 1982
4. Index Medicus for WHO South-East Asia Region had been compiled and the trial issue is scheduled to come out early in 1983
5. Consultations have been provided by SEARO to assist in this development of the network.
6. Retrospective bibliographies are being published, e.g. an Annotated Bibliography of medical literature in Burma 1866-1980 Compiled by Mrs. Khin Thet Htar.
7. Free MEDLINE searches and photocopies are being provided.
8. HELLIS Newsletter has been brought out to disseminate relevant information of HELLIS activities.
9. Regional HELLIS Committee has been constituted to advise the development of Regional Network.

The HELLIS Network is important because it aims to serve not only the relatively small number of persons in the medical schools and research institutes but also to meet the literature and information needs of the vast number of health professionals and other health workers posted in the peripheral regions of the country.

In January 1983 Karolinska Institute Library and Information Centre in Stockholm, Sweden has agreed to supply SEARO and SEARO Countries with up to 500 retrospective and current awareness searches a year for three years. No photocopies will be supplied.

Steps are also being taken by the WHO Regional Office, New Delhi to identfy and improve the capabilities of libraries in the network, so that all libraries will have at least the basic collection of books and journals. This should increase the number of medical libraries capable of meeting the minimum requirements of its readers.

Since, the First Consultative meeting was held in New Delhi in 1979, HELLIS has made significant strides and several inter-country cooperative activities have taken place for the development of the services at the national level. It is also felt that the development of the participating libraries need to be accelerated in order that they acquire the capabilities to deal with the ever increasing pace of the development of information sciences in industrializely developed countries.

The establishment of the regional network of Health Literature, Library and Information Services (HELLIS) is a step in the right direction.

LINKAGE OF THE HSR INFORMATION SYSTEM TO HELLIS

In December 1981 it was reiterated that there was inadequate information on Health Services Research (HSR) activities, methods and results, and therefore suggested the following steps.

1. Collecting, comparing and disseminating documentation on research methods, management, processes and results.
2. Development and dissemination of case studies and other training materials.

In order to accomplish this, it was also suggested that rather than setting up de novo documentation centres and clearinghouses for HSR in each country, the existing HELLIS Networks in the countries be used to set up an HSR Information System. It was also suggested that HSR information should include the collection of what is known as "grey" or "fugitive" literature.

In order to develop standard "Procedures in the HSR Information System," a Consultative meeting of HSR and HELLIS National Focal Points (NFPS) was held from 4-11 January 1983 at WHO Regional Office for Southeast Asia, New Delhi with the following objectives:

1. Identification and enumeration of different sources of HSR information (Primary, secondary, indicative sources) for the purpose of collection.
2. Standard format consisting of different facets of HSR information for maintaining consistency and uniformity while collecting this information.
3. Specific methods of classification and indexing of HSR information at national and regional levels for expeditions retrieval of this information.
4. Procedure of validation of the information collected in standard for the purpose of manual as well as mechanical storage.
5. Plan for dissemination of HSR information through various channels tailored to the needs of potential user group. (12)

The draft of "Guidelines for collection, selection, processing and dissemination of Health Services Research Information, including fugitive literature" has been drawn, and be expected to put into use by this year (1983)

WHO/WPRO In 1978, there was an effort to dicuss on health-related information in the Western Pacific Region. A working Group of Librarians Meeting on Biomedical Research Information Exchange was held in Manila from 13-16 November, 1978 and attended by librarians from Australia, Malaysia, New Zealand, Papua New Guinea, the Philippines, the Republic of Korea and Singapore.

The objective of the meeting was to make recommendations on the direction WHO collaboration with Member States should take in the development and establisment of a regional biomedical information programme in the Western Pacific Region and on priority activities to be undertaken in this respect at national and regional levels.

The meeting gave the following recommendations:

1. The establishment of a regional library network, and several other specific current awareness projects to be carried out by the various libraries represented.
2. The pre-pilot projects, a bibliographical compilation of articles on health services research not indexed by any of the

established indexing agencies in the West, was assigned to the National University of Singapore Medical Library with a view to establishing a continuing data base on the same topic of the bibliography was found to be useful to the research workers and health personnel.

3. The establishment of a regional biomedical information exchange centre.
4. The provision of a free MEDLINE and document delivery service to researchers.
5. The designation of one or more depositories in each country for health related documents.
6. The improvement of communications between the medical libraries.

Activities that has been able to carry out:

1. The completion of the pre pilot poject and a proposal for it to be continued as an on going project.
2. The agreement signed between WHO and the Australian Government to provide a service for the free supply of MEDLARS retrospective searches, MEDLARS SDI searches and photocopies to health and biomedical libraries in the developing countries of the Western Pacific Region.
3. National Focal Points were set up by the Ministry of Health of each country to process the search and photocopy requests. (13)

It can be said that the WHO is very concerned in the strengthening of national biomedical information networks.

SEAMIC

SEAMIC (Southeast Asian Medical Information Center) was set up in 1972 under the auspices of the International Medical Foundation of Japan (IMFJ) to assist the Southeast Asian Countries in health planning, medical care and training of personnel through the exchange of medical and health information materials.

SEAMIC was one of the first organizations to hold a conference for the purpose of bringing together the medical librarians from Southeast Asia.

SEAMIC designates a major medical library or libraries in each of the five Asean countries to coordinate the activities.

Key medical libraries are found in the University of Indonesia, Airlangga University, Mahidol University, University of Philippines, University of Malaya and the National University of Singapore Libraries also receive an annual book donation in addition to financial assistance for the purchase of equipment.

Activities are as follows:

International meetings : Conference, Workshops and Seminars
Information Services : Photocopy, MEDLARS service, Data exchange, Statistics, Publications and Newsletter.
Field surveys : Survey missions and Travel research fellowship.

One of the activities that deal with this topic is Publications. SEAMIC originated medical books which are of interest to the SEAMIC participating countries are published for distribution. Useful documents for publishing are recommended by participating countries. The Ministry of Health from each country appointed a SEAMIC Advisory Committee to recommend to SEAMIC suitable materials for publications.

At the Ninth SEAMIC Seminar held in Surabaya under the theme "Multilateral Collaboration on SEAMIC Health Sciences Documentation and Library services Activities" where it was discussed to strengthen SEAMIC Publications activities and strategy ideas for collection development in libraries of SEAMIC countries. Paper deals with this matter gave recommendations as follows:-

I. Strengthen SEAMIC Publication.
  1. Advisory Committee on Publication in each country
    1.1 to inform central committee of out of print SEAMIC publications still needed in the country, for SEAMIC to be able to plan for reprinting them.
    1.2 to appraise central committee of "dormant and valuable" publications in the country which have already been published, but still relevant and useful, for possible reprinting by SEAMIC.
    1.3 to encourage "home" authors to write in the national language of the country.

1.4 to suggest that consignment arrangements with responsible book jobbers in each country be made by SEAMIC for possible disposition of duplicate SEAMIC publications now in the Keys stations.

2. Key Persons
    2.1 to call attention of SEAMIC to new local publications for possible acquisition and distribution to depot libraries by SEAMIC
    2.2 to review with central committee distribution list of SEAMIC publications to avoid duplication and to make list a functional one
    2.3 to furnish central committee with information regarding new serial titles for inclusion in subsequent edition of Union List and Directory of Periodicals.
    2.4 to send in comments and corrections regarding the new reference tools published by SEAMIC

II Strategy Ideas for Collection Development

1. Book Donation Program
    1.1 Increase allotment yearly to meet inflation.
    1.2 Improve list from which choice of titles is made; to make it well-balanced inclucle
    More books of British and Foreign origins
    More reference books
    Titles in Delivery of Health care, medical education, herbal medicine, acupuncture.
2. SEAMIC to consider regular underwriting of Cumulative Index Medicus for Key Stations, to facilitate order procedure and help defray cost of an expensive item.
3. SEAMIC to consider providing Key stations with standard and / or new edition of technical processing tools which are also expensive.
4. Reactive Gifts and Exchanges Arrangements among SEAMIC libraries, by providing exchange and / or want lists, to help in collections development. (15)

For the past ten years SEAMIC has made so many important and constructive activities possible to member countries. Photocopy and MEDLARS searches have brought easy reach information and publication that are not available. SEAMIC's publications have proved to be very useful resources. Through annual conferences, seminars and workshops for both health professional and medical librarians in the region have been able to get together and to learn from each other through the exchange of information and data. Annual travel research fellowship programme has enabled, a number of well-qualified health personnel from SEAMIC'S member countries in the region to have discussions with their counterparts and to conduct research.

In implementing its functions, SEAMIC maintains close collaboration with some international organizations such as the WHO Regional Office of Western Pacific, the WHO Regional Office of Southeast Asia, the Southeast Asian Ministers of Education Organization / Regional Tropical Medicine and Public Health Project.

CONCLUSION

Medical libraries in Asean countries dispose considerable resources and good expertise in international cooperation. Cooperative acquisition on an international scale would be a great help to reduce cost and improve quality.

Most medical libraries have been using the MEDLARS services through SEAMIC, WHO, and National Library of Australia for many years, but not through any on-line access arrangements. In order to give good services, on-line search services should be explored the feasibility to install MEDLINE terminals in all "key medical libraries".

It is also advisable for the regional network to utilize available telex networks and other means to enhance communication between the participating libraries.

With the cooperation and knowledge of our experience, it will be possible to change the situation and achieve an evolution within the context of our realities.

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Annex I

HELLIS

HEALTH SCIENCE LITERATURE LIBRARY AND INFORMATION

National Focal Point

Librarian
National Medical Library and Documentation Centre
Institute of Public Health Premises
Mohakhali
Dacca-12, Bangladesh

Officer-in-charge
Central Biomedical Library
Ministry of Health
Department of Medical Research
No.5 Zafar Shah Road,
Rangoon, Burma

Deputy Director
National Medical Library
Ansari Nagar, Ring Road
New Delhi

National Institute of Health Research and Development
Ministry of Health
Jakarta, Indonesia

Bir Hospital Library
Bir Hospital
Kathmandu, Nepal

Librarian
Faculty of Medicine
University of Colombo
Colombo, Sri Lanka

Director, Library Division
Siriraj Hospital
Mahidol University
Bangkok 10700, Thailand

Ministry of Health

Banglades
Burma
India
Indonesia
Nepal

University

Sir Lanka
Thailand

SOUTHEAST ASIA MEDICAL INFORMATION CENTER (SEAMIC)

MEDLARS KEY STATION

Director
Airlangga University Library
Surabaya,
Indonesia

Librarian
Medical Library
University of Malaya, Kuala Lumpur
Malaysia

Librarian
Medical Library
College of Medicine
University of Philippines
Philippines

Librarian
Medical Library
National University of Singapore
Singapore

Director
Library Division (Siriraj Medical Library)
Mahidol University
Siriraj Hospital

Annex III

SEAMIC BOOK DEPOT

INDONESIA

* University of Indonesia, Faculty of Medicine, Library
University of North Sumatra, Faculty of Medicine, Library
Airlangga University, Library
Ministry of Health, Central Health Library

MALAYSIA

* University of Malaya, Medical Library
Institute for Medical Research, Library
Ministry of Health, International Health Section for Secretary General

PHILIPPINES

* University of the Philippines System, College of Medicine
Medical Library
Department of Health Attention : Deputy Minister

SINGAPORE

* University of Singapore, Faculty of Medicine, Medical Library
Ministry of Health Attention : Permanent Secretary

THAILAND

* Mahidol University, Library Division (Siriraj Medical Library)
Siriraj Hospital
Ministry of Public Health Attention : Under-Secretary
Chiangmai University, Faculty of Medicine, Library

* Main Book Depot

SEAMIC ADVISORY COMMITTEE ON PUBLICATION

INDONESIA :	
MALAYSIA :	Institute of Medical Research Ministry of Health Malaysia National University Science University of Malaysia University of Malaya
PHILIPPINES :	Bureau of Research & Laboratories Ministry of Health Philippine Public Health Association Journal University of the Philippines System, College of Medicine Library University of the Philippines System, Institute of Public Health Library
SINGAPORE :	Ministry of Health University of Singapore, Medical Library
THAILAND :	Mahidol University, Library Division (Siriraj Medical Library) Ministry of Health, Division of Health Planning Ministry of Health, Division of Health Statistics SEAMEO-TROPMED Project.

SEMIC PUBLICATIONS

No.1 Gastrointestinal Infections in Southeast Asia (I): Proceedings of the Second SEAMIC Seminar on Information Activities on the Status of Gastro-Intextinal Infections in Southeast Asia Held in Tokyo in 1974, ed. by Osamu KITAMOTO. 1975. charts. 251p.

No.2 Color Atlas of Human Helminth Eggs: by Noriji SUZUKI. 1975. color plts, 95p.

No.3 Seven Decades of Public Health in the Philippines (1898-1972) : by Teodora V. TIGLAO. 1975. illus. 310p.

No.4 Handbook of Direct Smear Examination of Sputum for Tubercle Bacillus: by Shozo TAKAHASHI. 1975. Illus. 234p.

No.5 BIBLIOMED-SM: A Comprehensive Bibliography of Medicine and Related Sciences in Singapore and Malaysia, comp. & ed. by George C.H. EE. 1976. 2vols.

No.6 Manual for the Isolation and Identification of Entero-Pathogenic Bacteria: by Hiroshi ZEN-YOJI, Makoto OHASHI and Yasuo KUDOH. 1976. charts. 144p.

No.7 Health Information for National Health Planning in Southeast Asia: Proceedings of the Third SEAMIC Workshop on Health Statistics held in Singapore in 1976. ed. by Nobuhiro MARUCHI. 1976. charts. 128p.

No.8 Health Aspects of Community Development in Southeast Asia: Proceedings of the Fourth SEAMIC Seminar on Health Aspects of Community Development: Community Health/ Medicine held in Tokyo in 1976. ed. by Haruo KATSUNUMA, Nobuhiro MARUCHI and Masami TOGO. 1977. charts. 285p.

No.9 Gastrointestinal Infections in Southeast Asia (II): Proceedings of the Third SEAMIC Seminar on Laboratory Works and Preventive Measures in Gastrointestinal Infections in Southeast Asia held in Tokyo in 1976. ed. Hideo FUKUMI. 1977. charts. 131p.

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186-PRE SESSION-9-E

New Information Technologies available in the industrialised world

by

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ABSTRACT

The paper reports on a number of technologies and applications of information processes that overlap and inter-relate under the current heading of New Information Technologies. Some emphasis is laid on the implications for appropriate levels of implementation in developing countries, and on some of the questions that arise in connection with the new technologies insofar as copyright, library management and other matters of new ways of achieving old ends. The conclusion is that there is a need for libraries in developing countries to see their way to keeping up with some of the new developments and that the implementation of micro-computer applications is likely to be most satisfactorily accomplished.

SW Massil.

INTRODUCTION

In addressing a paper on New Information Technology available in the countries of the developed and industrialised world to librarians from Developing Countries, the questions of appropriate technology and appropriateness of systems loom very large in the background. My contribution to this Pre-Conference Seminar comes as part of a formal address from the Standing Committee on Information Technology of IFLA and wa invited as a resume or overview of the range of equipment, techniques and systems available to the practice of librarianship and documentation at the present time.

The traditions and developments of library practice and management have been absorbed and promoted in the industrialised and developing worlds alike. The endeavours of Unesco, FID and IFLA, as well as of other bodies have been to foster the advancement of librarianship and information services throughout the world based on the traditions and standards of the developed countries. The problem of transfer has always been one of the most interesting of phenomena, and it is a cardinal aspect of general and cultural development. In the field of information, librarianship and documentation the question of transfer presents its most sensitive and ramified form, for in the communication of information we are dealing with both the thing itself and with the method. It is not the purpose of this paper to evaluate the quality of the librarianship of the developed countries or the effectiveness of its transposition and application in developing countries; nor is it necessary to present, in strictness, more than an inventory of available 'new technology' in giving an extended account of the equipment and systems associated with them; so rapid is the current pace of innovation and elaboration of technologies it is not easy to remain uptodate on them all in any case. Nevertheless, it is not possible either to avoid those questions of appropriate technology that make the question of transfer so crucial an aspect of the whole development process, especially as I believe that the development of information systems and services is one of the pivots of development in any sense.

The advent of automation has made more stark than ever the differences between levels of development; it has added a dimension to the problem of under-development in that the trend of information services has become more international and displaced. Developments in publishing and information storage have increased the dependence of outside users upon services upheld elsewhere (in the developed world - but the question of dependence applies equally to a country like Britain accessing data bases maintained elsewhere, as to any of the countries represented at this Seminar). Old technology, notwithstanding the role of telephone and telex links, tended to consist of mechanical equipment - machines to speed up processes, to achieve better products and to produce them in greater numbers. New technology is different intrinsically because its focus is to manipulate data and to effect electronically a transformation of data stored, retrieved and displayed for whatever purposes and with whatever co-efficients of speed and diversity that can enhance its results. What it offers is a greater diversity of sources and channels, and a more active role for libraries; but also the possibility that libraries can be by-passed altogether by the momentum of newer information opportunities and ways of meeting them.

NEW INFORMATION TECHNOLOGIES

The diversity of developments in new technology has increased and is increasing to the extent that it is difficult to keep abreast of all the possibilities open, which combine themselves to generate whole 'complexes' of activity such as the 'electronic office' where features of the new technology come together and create a new plateau of activity altogether. The problem with the application of new technologies to libraries, as no doubt in other rather conservative spheres is that a commitment to a course of procedure is limiting once a choice is made, because of financial considerations. The advent of computerisation has left some libraries behind waiting for developments that arise and supersede each other too rapidly, to stabilise; there is always a better machine, a better system on the way.
There are of course different levels of technology, and of levels of complexity that vary according to the specific area of work into which new technology is finding its way. As indicated, the present all-pervasive pressure of the concept of new technology is felt to apply in the province of automated systems, network technology, data bases and the manipulation of library records. A proper over-view of the new technology becoming prominent in all fields of librarianship and information services should embrace some of the recent advances in mechanical developments relating to library buildings - shelving, trolleys, lifts, air-conditioning, preservation, counter turnstiles that interconnect with files controlling right of access, lightpen systems, book conveyors, audio-visual aids and so on - as well as those relating to techniques of catalogue production, data base management, information retrieval packages and systems. But in fact, the developments relating to publishing, document production, reprography, preservation, dissemination and retrieval that have made the greatest advances offer the greatest sign of the changing environment characterised by the new technology; these are more specifically identified by the term information technology - electronic publishing and document delivery, for instance, the area covered by videotex developments, electronic mail and other components of integrated office systems design. Technology has been available, if not the mainspring of all these activities, 'new technology' makes all the difference in the way we consider them and their transformation.

The rate of developments has accelerated and publicity about equipment, to use a term more appropriate perhaps to the 'old technology', passes from the electronics journals (such as the 'IEEE journal of solid state circuits') to the applications level - in business, commercial or banking fields probably, ahead of librarianship and information fields - very rapidly these days. In the strictly electronics sense we are talking about the expansion of silicon-based technology, yet in the literature of applied chemical research there is evidence of a high-level of activity in the fields of films of the elements from the third and fourth groups of the Periodic Table, where the 'front-runner' is gallenium arsenide which has an even higher electron mobility rate than silicon so that the prospect is of developments combining greater concentration of storage with intensified rapidity of retrieval and transfer. We are into the era of fifth-generation computers and the vindication of automation based upon artificial intelligence.The new technology arises out of advanced industrial and chemical technologies, electronic circuitry, optical fibres, lasers, plastics, the ever-increasing capacity of videodiscs that more durable than books, paper etc., with a greater capacity than floppy disks and microfiche (itself only an intermediate technology) do not undergo chemical deterioration and do not need to be re-written in order to preserve their contents and so have greater archival capacity. It is out of the combining and integration of systems based upon these technologies that the 'paperless' society is emerging.

The new technology is having considerable impact in the fields of publishing, education, entertainment and all manner of 'office' systems generating and applying information - commerce and banking, the information industry generally (the successor field in industrialisation after manufacturing), and the whole gamut is of intense relevance to libraries.
It is a mark of the improvements in publishing that academic publishers in the UK can now contemplate an edition run of under 1,000 copies for a new book whereas a few years ago the need was for a printing of 2,000 copies to make a profitable proposition; this is not the place to do more than intimate the implications for book selection and ordering. The trend in the publishing of scientific journals is towards electronic publishing, receipt of copy, circulation of drafts and editing on-line, retrieval and issue by computer and not in hard copy except on demand. Alternatives are mini-print or microfiche printing where libraries would go for the microfiche and individual subscribers for miniprint versions.

From the library point of view there are many developments in microform reproduction, copying - diazo microfiche duplicators, reader-printers - photography, such as the arrival of a 35mm planetary camera for maps, plans and drawings; flow cameras, stop-and-repeat cameras to produce updateable microfiche; microform storage and retrieval systems - automated microform systems that are an alternative to electronic document storage, and combine devices for software-driven floppy disc based microprocessing achieving the indexing and access to documents stored in film cartridges; photocopying, where coated and plain paper copying are under constant development at a long distance from the stencil and hectographic duplication processes still to be found in developing countries; colour copying is under development; 'intelligent' copiers that serve as conventional copiers but also accept digital input from tape cassettes cards or discs and have in addition a vdu for electronic mail (Xerox 5700 Intelligent copier).
Computer output microform (COM) originally entailed microfilm and now results predominantly in microfiche and is becoming subject to laser imaging dispensing with chemical processing; a COM device can be attached like a printer to an on-line system.
Computer input microform (CIM) is less talked about after an initial surge of intere

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some years ago, is the means by which printed or manuscript text might be filmed and input to a computer for manipulation and reproduction in other forms.

Computer assisted retrieval (CAR) is applied as above to systems of automating microform storage and retrieval.

It might be assumed that the new technology (silicon chips) will reduce the role of microforms, but in some ways are advancing the medium which is essentially of an 'intermediate nature' by providing improved products and very effective retrieval systems. There is though great competition between on-line and microform services, and videodisc technology is introducing a third way with the advent of electronic digitising systems.

Videodisc technology is making great strides in the fields of publishing, education and especially entertainment. The videodisc is a relatively inexpensivestorage medium and the videodisc 'player' is well suited to interact with computers and therefore can take applications software for a full range of storage and retrieval, covering textual, visual and audiovisual material. It is suitable for mass replication and because of the computer 'back-up' that it enjoys the videodisc offers an advantage over conventional publishing so far as electronic publishing is concerned in that it offers automatic indexing, and also more sophisticated aspects of index and retrieval work.

Videotex is engaging great interest at the moment. It is a system linking the 'traditional' television receiver through telephone to a computer affording an information delivery service. This can be a two-way process involving data-collection and delivery; examples are Prestel, Videotel, Teledata, Telidon, Bildschirmtext, which are operational systems. They are based on telecommunication infrastructures in either the broadcasting field or the telephone systems of different countries promoting them. Instead of a television a more specialised receiver is possible, amounting to a telephone receiver enhanced by a tv screen. In countries where the telephone service is less well developed videotex via broadcasting has the more likely future. The efficiency of such systems depends upon the way information is stored, their acceptability will depend also upon techniques for presentation and layout of information for use on videos and in on-line use. Videotex invites consideration of the nature of the information carried, the role of the provider as 'common carrier' or editor (in the promulgation of the electronic encyclopaedia), as gateway linking a videotex operation to external computers for furtherinput and data handling in specific contexts, law etc.

Facsimile transmission has been under investigation for a considerable time now, experiments continue and developments are awaited in practical applications.

Alongside applications for document delivery the question of new techniques for conservation should be mentioned - 'overhead photocopiers' that allow books to copied face up with no damage to their spines etc are under development (on demonstration at the British Library is one version) - and the British Library also has an 'image digitizer' to scan and rapidly convert the contents of a page for electronic storage, remotely, for 'reconstruction' and reproduction in hard copy or memory storage, for which the very high capacity of optical discs now

under development is likely to be ideal. The new techniques are necessary for both conservation of texts and preservation of original (valuable, fragile) source documents; other aspects of conservation where there are highly specialised developments are those of de-acidifying, laminating, encapsulation in polyester, decontamination, humidity and temperature control for display cabinets. New equipment is being brought into the field of bibliggraphic research - fibre-optic lamps (cold beam for document-safety) to reveal hiddeninformation, watermarks etc., electroluminescent lamps; ultra-violet or infra-red techniques for examination of inks; x-ray photography or electron radiation for selective photography of texts and paper. The Hinman collating machine designed for the bibliographic comparison of different copies of Shakespeare's First folio nearly twenty years ago might be deemed 'old technology', its capacity for comparing editions of the same work is continued in what the British library calls a 'comparator' which superimposes images of pages from different editions and shows up the minutest differences in the texts; it has specific applications in philately too.
To draw together some of the foregoing threads in the review of new technology developments, their applications in specific fields of library and information house-keeping and reader services should also be indicated more directly. Increasing capacity and speed of computer memory and processing, videodisc, optical disc and advances in techniques for input and output have every relevance for data base syst upon which automated library developments depend. Early library computer-based systems relied upon main-frame computers and batch systems. With the advent of minicomputers and microcomputers the earlier approach has not been eliminated but current developments and availability make for greater flexibility of systems and pressure upon development.

The outstanding fact of the world's information supply is that it is international; the number of data bases available is enormous, the number of organisations offering access to data bases is very large. Data bases are accessed via hosts to the information network. Tymnet, Telenet, Euronet are examples of networks through which access is afforded to on-line services such as Dialog, SDS, BRS, BLAISE and DIMDI. These services provide access to individual files and data services - for citations, indexing and abstracts leading to requests for document retrieval and regular matching of user profiles.

In housekeeping terms we are talking of bibliographic services based upon the MARC data bases, bibliographic 'utilities' or services such as OCLC or RLIN; BLCMP, SWALCAP and SCOLCAP in the United Kingdom as well as the British Library's LOCAS service; circulation systems and packages marketed by the Canadian GEAC company; a host of library software packages for use in word-processing and with micro-computers in stand-alone systems. The stand-alone system brings a library independence with a tailor-made system (for whatever application) which may be fed with new records from a MARC-based service but which runs solely under the library' control. All the major utilities are now taking steps to diversify their main-frame activities into such systems giving their members and other customers greater freedom of choice and operation.

There is great potential in the development of local microcomputer networks with the handling of all the bibliographic data of an individual institution on a micro in a network linking the files of other institutions sharing data and software but not needing to maintain huge files in the process.

The next step forward in the development of housekeeping systems will be in the area of integrating acquisitions and cataloguing systems; the infusion of electronic ordering transmission into both library and book trade automation will bring this about more effectively than systems designed hitherto.

To conclude this section on a lighter note, it is of interest to consider that one of the oldest forms of electronic message in Britain, the telegram, has in the year following Information Technology Year (1982), just been eliminated from the services offered by British Telecom.

SOME CONSIDERATIONS AND IMPLICATIONS OF THE NEW TECHNOLOGY

In British public libraries there was once a long debate over the provision of gramophone lending collections, resolved in favour of extending lending services to the public in these materials. Now the debate is on over acquisition and lending of video material at a time of mushrooming production and alternative commercial availability.

Extensive photocopying and the availability of copying services outside of libraries has highlighted anew questions of copyright; the processes of electronic publishing infuse a new dimension into the question of copyright.

The transmission of data in other than printed form brings up the questions of trans-border data flow which seem to exercise governments very considerably. A related question is of privacy of data in machine-based systems.

New technologies are accelerating the decentralisation of decision-making, establishing greater local autonomy (of business firms for instance). There is a challenge implicit in the new technology in national terms for it to be directed along socially and economically acceptable lines, and the problems of privacy and of videotex and the freedom of the press for instance, are only a part of this. In the office environment where word-processors are taking over from the typing-pool staff are under much greater supervision than before and are unhappy about this. The ergonomic aspects of using new equipment must be considered; where word-processors and micro-processor control are operating work can be so simplified that trained operators may be eliminated. On the other hand, some of the components of technology-based systems may not be suitable for casual use and public access and may require a high degree of training and familiarity. As regards installation of advanced equipment in unfriendly environments, one must be sure that the equipment is designed for climatic conditions of great intensity and that they can be maintained by locally-based technicians.

Management of library and information services is undergoing considerable development under the pressure of the introduction of new technologies; there are questions of staffing, costs (of information in book and in electronic form), labour and manpower considerations, training and re-deployment.

From the point of libraries generally, major implications are questions of keeping abreast of developments - the rest of the world, in business, education, publishing and bookselling, is already involved in applying available and new technology, libraries cannot afford to be left behind. One suggestion is that libraries will be by-passed by the new advances in information technology. Why should the research worker with a terminal in his office go to a library? Authors can by-pass publishers to have their research made available through electronic systems, readers can by-pass libraries when accessing such files of work-in-progress.

LITERATURE AND PROJECTS

All the regular library and information systems journals bring forward reports and and analyses of new systems and techniques for library housekeeping and information services. The fact of new technology for libraries is inescapable nowadays. Electronic information technology is pre-occupying the documentation and library journals and has generated new ones. It is a growth area for new journals (in printed form one should emphasize). 'Electronic publishing review' has as its sub-title 'the international journal for the transfer of published information via videotex and on-line media'.

Under the heading 'Document reproduction survey' Bernard Williams, Director of the NRCd contributes a regular report to the 'FID News Bulletin' on new equipment and developments across a wide spectrum of the field. Fuller evaluative reports of a Which? consumers' guide character are put out by the NRCd and other organisations dedicated to to the technical investigation and user-guidance on current new equipment. One can pick up news about major developments on such things as Optical Disks from the 'Library of Congress Information Bulletin'.

1982 was designated Information Technology Year in the UK and various projects established in the period have been mainatined and developed. One such is the Information Technology Centre at the Polytechnic of Central London, supported by grants from the Department of Industry and the British Library - it aims to familiaris librarians and information scientists with developments of computer applications with particular reference to microcomputers. There is the BLEND (Birmingham and Loughborough) project on electronic communication/journals, an experiment amongst other things in the human use of computers. The Department of Industry has also set up Project HERMES involvingwork on teletex activities.

The theme is a constant one; business sections of newspapers regularly devote features to information technology and its place in commerce, the professions, schools and the home.

American sources are full of the advances in new technology; Cuadra Associates, Santa Monica, Frost & Sullivan, New York, Butler, Cox, International Resource Development Inc., and a host of others put out reports, especially on Viewdata and videotex applications.

Conferences, symposia and business exhibits abound. While home-banking and shopping services promoted by the latter may not seem relevant to libraries but it is clear that library applications follow hard upon the innovations of business, official telecommunications and commercial life. The advent of software packages, word processing and micro-computing in office technology make it important for libraries not to let such opportunities slip once the machinery and systems become available. organisations involved with computers in banking and accounting in particular have quickly turned to the generation of library packages. There is great scope for seeing the implications for libraries in the business literature about new and information technology.

CONCLUSION

As I indicated at the outset, I am more interested in the applicability and appropriateness of the new technology to libraries and in the modes of implementing new systems than in the equipment and systems themselves. Libraries and institutions tend to be conservative and traditionalist in their approach - in the context of national development in which information itself is a prime vehicle for the development process, as well as in terms of the new Information Technology and the opportunities it offers, there is a great challenge to libraries in developing countries. It seems important for these libraries and documentation centres to be in the vanguard of development and to be seen to be fostering the implementation of new systems rather than to be lagging in the wake of other spheres. If agricultural, industrial and social development seem to be paramount in the eyes of national planners, nevertheless, because it is through information transfer that these areas make their advances, it would be reasonable to promote the idea that information services should be allowed to show proper application of the most advanced technology possible as their contribution to general development. The pattern after all amongst developed countries has been a transition from agriculture to industrial development, from industrialisation to manufacturing based progress, and now in a phase of intense development in communications and information technology it is these products that are becoming paramount.

It is of course not easy to take on advanced technology as a matter of course. As well as the sheer weight of traditionalsim, a gamut of local factors applies inhibiting a straightforward adoption of advanced methods; reference has already been made to questions of climate and problems of power supply, poor telecommunication and so on (the condition of books, paper and film is made more difficult when high level equipment designed to reproduce and conserve them itself needs equal protection). The labour question seems to be crucial in that new technological devices are seen to be labour-saving - national employment policies on the face of it require extension of employment and not reduction of opportunities. There are areas of the information process where labour is needed and can be expected to justify recruitment; traditional methods of librarianship should not be retained at the expense of innovation. Management and professionalism must justify themselves by the extent to which they can absorb and adapt to new developments.

Amidst some of the more grandiose and futuristic prospects opened by the discussion of new information technology the message of small and independent systems should not be ignored. A strong case can be made out for the implementation of low-cost microcomputer systems for use in information and retrieval as well as for housekeeping; even small organisations are able to benefit from advanced technology and should plan to do so.

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187-PRE SESSION-10-E

Choosing the Moment: A Review of the Organizational Problems and Changes Arising Out of Conversion to Computerized Systems

by

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CHOOSING THE MOMENT:

A REVIEW OF THE ORGANISATIONAL PROBLEMS AND CHANGES ARISING OUT OF CONVERSION TO COMPUTERISED SYSTEMS

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INTRODUCTION

To many observers who are knowledgeable about library conditions in the Third World, it may be inappropriate in a forum of this kind to discuss computerization. Keren and Harmon (1980, p.291) have noted that many of the less developed countries (LDCs) face the following common problems in the provision of information services:

(a) Lack of appreciation by national decision makers of the role of STI (Science and Technology Information) in development.

(b) The absence of an adequate infrastructure for information storage and processing.

(c) The absence of an adequate infrastructure for information use and absorption by users.

(d) Economic, administrative, technological, cultural, educational, and structural barriers to an adequate information flow.

Kotei in a very stimulating article has shown that many differences exist between the cultures of the developed and less developed countries which affect the growth and development of their library systems. In particular, he has attempted to explain the underdevelopment of books and libraries in the traditional societies of Asia and Africa as being due to the fact that these societies are predominantly pre-literate, that is to say, they have no "schools and colleges, let alone libraries by which to transmit both their material and intrinsic culture," and hence "their total reliance on oral communication for formal and humanistic education, economic organization, social control, history and the literary arts." (Kotei, 1977, p.253). In contrast, Western material culture owes everything to "the stock of ideas set out in books and taught in schools and colleges." (Kotei, 1977, p.253)

In the light of these great differences, the perennial question that comes to mind is whether it is appropriate for libraries in the developing world to embrace one of the most advanced of technologies of the developed world, namely, the computer. However, in spite of the fact that many LDCs have relatively poor library and information services, a strong argument can be made out for the adoption of automation, especially by the libraries of universities and institutions of higher learning. This is because university libraries in the developing world are generally better supported than other types of libraries. This statement is definitely true among the university libraries of the ASEAN countries.* A recent Conference of Chief Librarians and Directors of Government-Supported University Libraries in the ASEAN Region, held in Sabah, Malaysia, from 14 to 16 March, 1983, has revealed that many university libraries in this region have collections ranging from 100,000 to over a million volumes, and that a number of them have already computerized some of their library operations or are in the process of doing so. A study of the university library situation in other regions of the developing world will no doubt also reveal that university libraries are generally in a far more advanced stage of development than expected.

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*ASEAN (Association of Southeast Asian Nations) is a political grouping comprising the countries of Indonesia, the Philippines, Malaysia, Singapore and Thailand.

THE IMPERATIVES FOR AUTOMATION

University libraries in the developing world are faced with a dilemma seldom before faced in their history, or even experienced by the libraries in the developed world. As they begin to gain increasing financial support from their authorities and begin to develop along the lines of academic libraries in the more developed countries, they find that the traditional model of the academic library is rapidly becoming obsolete. The academic library of today is rapidly evolving into a new kind of institution. It is no longer merely an autonomous and self-sufficient entity serving the needs of the academic community, but has become just a node in an information network encompassing not only other libraries but also other components of the information system, including publishers, professional societies, information brokers, data base producers and the like. Because advances in computer and communications technology have reduced the time and cost needed to span distances between users and the sources of information, the academic library has been forced to adapt to this new environment so that it will not be replaced or superceded by other information entities which can just as effeciently provide the information required by its users.

Given the current trends and developments in the developed world, the libraries of the developing countries do not seem to have much choice. They must adopt the new information technology or they will become obsolete if not irrelevant. The question is not *whether* they should automate but *when*; and the short answer appears to be *now*, not tomorrow and not later.

There are several imperatives that support this categorical statement and these will be discussed briefly in the sections that follow.

THE ECONOMIC IMPERATIVE

The traditional view is that the less developed countries should not imitate the advanced countries by adopting their more advanced technologies because unlike the latter, LDCs have an abundance of labour and a scarcity of capital. Consequently, it is argued that the LDCs should employ techniques which require less capital and more labour per unit of output. However, this traditional view has been subjected to question of late and the eminent economist Nicholas Kaldor himself has questioned the basic premise that "underdeveloped countries would stand to gain from the use of special labour-intensive technologies." (Kaldor, 1972, p.11) On the contrary, he argues that is is a fallacy to believe that more primitive techniques which require less capital per worker are also more economical in capital per unit of output. He points out that a lower capital/labour ratio does not necessarily imply a lower capital/output ratio. Indeed, the reverse is often the case as is illustrated in many developed countries with very highly mechanized industries. In the United States, for example, the capital/output ratio has been falling while the capital/labour ratio has been steadily rising.

Kaldor goes on to show that surplus labour is not to be regarded as a "free good". However great the unemployment or disguised employment situation, labour has still to be paid wages, and a higher level of employment also means a higher wage bill and a correspondingly higher demand for consumption goods. He therefore recommends that the LDCs should choose "the techniques which, at the prevailing and expected level of wages, yield the highest rate of profit per unit of investment: for, as a general rule, the techniques which yield the highest rate of profit serve to maximise the ratio of output to the additional consumption generated in producing that output..." (Kaldor, 1972, p.13) If the latest technologies normally yield the highest output per worker without any greater outlay of capital per unit of output, then the latest technologies must be superior to all other techniques, irrespective of the level of wages, and irrespective of the amount of capital required per worker. What this all means is that in most circumstances, the adoption of an advanced technology by a developing country need not necessarily be bad or unwise.

THE COSTS IMPERATIVE

With the current recessionary trends coupled with inflation affecting almost every country in the world, the academic library in both the developing and the developed world may be said to be in a state of crisis. Even in rich countries such as the United States, the halycon days when libraries appeared to have almost unlimited funding are over. For example, between 1967 and 1977, total funds allocated to academic libraries in the United States tripled. In real terms the increase was 66% (Cohen & Leeson, 1979, p.25). However, after 1977, there is evidence to indicate that academic libraries suffered a negative growth rate in real terms. Unfortunately, however, cutbacks in budgets have occurred at a time when the costs of published materials have been increasing. As Lancaster has pointed out, inflation in the publishing industry has been grossly out of step with inflation in the economy as a whole, for "in a period in which the general rate of inflation (measured by the Consumer Price Index) was 40 per cent, some secondary publications increased 850 per cent in price." (Lancaster et al, 1980, p.163) This trend has also been reflected in the subscription price of many journals.

For the libraries of many developing countries, this inflationary trend has been a real setback to their development. For example, many libraries in the ASEAN region have been getting steady increases in their budgets both in absolute and real terms until about 1981. But because of the recessionary pressures, cutbacks have been extreme, and some libraries have reported as much as a 45 per cent cut in their budgets. This fact coupled with inflation has priced many books, periodicals and abstracting and indexing services out of the reach of many libraries in the developing world. In this situation, some librarians have advocated the use of computer-based reference serves as a means of improving information access. C.P. Bourne has stated that in many developing countries where local libraries are still resource-poor, three alternative approaches are possible. The first alternative, which is also the cheapest, would be to maintain the status quo, that is, to do nothing to improve the information services of the country concerned Another alternative would be to pour a great deal of money to improve local collections in a conventional way. This is the most expensive alternative. An intermediate approach would be to provide a modest increase in financial support so that a computer-based selective disssemination of information system could be developed making use of relevant computer data bases. Bourne has cogently argues that "for many resource-poor facilities, the use of computer-based reference services to augment the current level of local information resources is felt to be the most attractive approach from a cost-benefit viewpoint..." (Bourne, 1977, p.44)

THE INFORMATION EXPLOSION IMPERATIVE

The term "information explosion" is a well-worn cliche. Nevertheless, it serves to provide a vivid imagery of the growth in the literature of science, technology, the social sciences and the humanities. Some authors have begun to use terms such as "the information flood" or to refer to "oceans of information" to emphasize the sense of helplessness faced by libraries and librarians. It has been pointed out that in the 1660s, two journals were adequate to meet the needs of the scientific community. Today, there are over 50,000 journals in science. *Chemical Abstracts* took 32 years to publish its millionth abstract, the fifth million took only 3.3 years to be published, and it is estimated that *Chemical Abstracts* will soon be publishing one million abstracts a year (Lancaster, 1980, p.163).

The information explosion has also a secondary or ripple effect. As the volume of literature grows, it becomes more difficult to find, to collect, to store and to catalogue. Delays in publishing as well in disseminating of knowledge using traditional media become the norm rather than the exception. It is no wonder that many librarians have reach the conclusion that "The future lies, quite clearly in increasing automation; and not only increasing automation of certain selected processes...it doesn't simply mean automation of circulation procedures in the library. It means automation *throughout the entire communications cycle* by which the results of science, social science and the humanities are distributed..." (Lancaster, 1980, p.166).

THE TECHNOLOGICAL IMPERATIVES

When Ellsworth Mason made his savage attacks on the use of computers in libraries in the early 1970's (Mason, 1971; 1972), computer technology was still in a relatively primitive stage of development compared with the advances that have been achieved today. I still remember the first mainframe computer acquired by my university at a cost of US$600,000 in 1972 which can be acquired for less than US$10,000 today in the form of a microcomputer. I shall not go into very great detail regarding the various advances in computer and communication technology, since these will be dealt with in a different paper by Stephen Massil, except to very briefly outline some important developments which have significant implications for libraries.

The first fact to note is that the cost of computers has been falling by a factor of 10 every four years. It has been said that if the motor car industry had advanced at the same rate, a Rolls Royce could be purchased today for US$2.00!

In the area of information processing hardware, the most significant development has been in the development of the microprocessor. The computing power of the microprocessor depends on, among other things, its speed of operation and what is known as its word length (measured in bits). The early microprocessors could only operate on four bits, but today the 32-bit microprocessor chip is available and before long it is expected that the 64-bit microprocessor will be available. The implication is that by the mid-1980s, processors which have the capabilities of computers currently used in small business will be available on a personal basis. Systems that could previously only run on mainframes or minicomputers could run on microcomputers.

There is, however, one caveat. While the cost of hardware has been falling, the cost of software has unfortunately been increasing. In 1973, software represented 5 per cent of the computer system costs; in 1978 this increased to 80 per cent. Fortunately, however, there are some promising developments. Firstly, there have been great improvements in software engineering, which may bring the cost of software development down. Secondly, there is now available what is called "solid-state software" that is software that is put into the hardware in the form of read-only memory (ROM). ROMs are now large enough to store a compiler for a language such as BASIC. Thirdly, there is an increasing availability of software that can be used for library purposes. A few examples will suffice.

At the microcomputer level, there is a data base management system called dBase II that can handle up to 65,535 records online. Each record can contain up to 32 fields with a total of 1,000 characters. At the mini-computer level, there is the MINISIS software developed by the International Development Research Centre in Canada, which can in many cases be given to developing countries free of charge. This software package runs on the HP 3000 series of minicomputers and is currently being used in a number of institutions throughout the world. In Singapore, for example, the National University of Singapore Library is using it for acquisitions, cataloguing and online retrieval. This software has also been made available to the Rubber Institute of Malaysia and the Palm Oil Research Institute of Malaysia.

There are several large systems available for mainframe computers. Three useful ones are Unesco's CDS/ISIS software package, the DOBIS/LIBIS system marketed by IBM and Battelle Memorial Institute's BASIS. CDS/ISIS is basically an information storage and retrieval system, and is particularly suitable for cataloguing and information retrieval. An arithmetic module is planned and this will make software useful for acquisitions also. This package is usually made available free of charge by Unesco to developing countries, with training in the use and installation of the system included. The DOBIS/LIBIS system is an integrated online system that contains many library functions, including cataloguing, circulation control, acquisitions and serials and binding control. BASIS, which has been operational since the 1970's has been installed in over 100 computer systems worldwide. It is basically a data base management system and has been used for acquisitions, cataloguing, circulation control and information retrieval. Its major advantage is that it is a machine transportable system which can operate on IBM, DEC, UNIVAC and CDC hardware. Both DOBIS/LIBIS and BASIS can be acquired for under US$50,000.00.

The number of software packages available for library applications is fairly large, and a listing of these with details of their cost and capabilities would be very useful for developing countries. Williams and Goldsmith have described a number of systems which can run on mini- and microcomputers (Williams & Goldsmith, 1981).

Library functions usually require vast amounts of computer storage. It is therefore useful to note that the cost of computer memory has also been dropping very dramatically - roughly a factor of 10 every four or five years. Basically computer memory can be classified into five types:

1. Semiconductor memory: bipolary and MOS (metal oxide-semiconductor) RAM (random access memory). This represents the high-speed, high-performance end of the memory range and used to be only found on very large computer systems, but can now be found on computers costing less than US$100,000.
2. Gap fillers: electron beam accessed memory (EBAM; also called BEAMOS for beamed access MOS), and charge-coupled device (CCD). This is the mid-range of memory devices, which are faster than mechanical devices such as fixed-head magnetic disks, but slower than semiconductor memories.
3. Magnetic disk: fixed head disk (FHD), moving head disk (MHD), and floppy disk.
4. Magnetic tape: cassette (about ¼ inch), standard compute tape (½ inch), and mass tape; and
5. Optical disk: video and optical digital disk.

Of the last three categories, categories 3 and 4 represent old technology and need no elaboration except that they are capable of storing relatively large amounts of digital data. The last category has arrived and will have profound implications for libraries. (Kubitz, 1979)

The optical disk is the highest density and lowest cost of storage yet developed. There are two basic approaches to recording on these disks: the analog method which yields colour television pictures and the digital method which yields data as digits. These represent read only devices although Matsushita has recently announced the development of both the read and write optical disk. In the analog mode, about 54,000 frames can be recorded while in the digital mode, the capacity is 10^{10} bits (the equivalent of 500,000 typewritten pages). Recently, it was reported that the Library of Congress has awarded two contracts for a pilot project to use laser optical disk technology for information preservation and management (*Library Association Record*, 85(2):61, Feb. 1983.) Teknetron Controls, inc. will develop a system using digital optical disks for computerized mass storage, preservation and retrieval of printed materials, including text and half-tone illustration, while Sony Video Communications will use analog optical disk production techniques to copy films, video tapes, photographs and graphics, and digital disks for two audio productions.

There have also been tremendous advances in communications technology, resulting in a fundamental and massive shift from analog to digital modes of transmission. Digital modes are not only cheaper, they eliminate the noise problems inherent in analog devices, and finally they permit easier communication between computers and other digital devices. These improvements in communications technology have undoubtedly facilitated the development of library networks.

THE ORGANIZATIONAL RESPONSES

It is clear from the above discussion that the trend towards automation is inevitable and any attempt to resist this trend will be as futile as King Canute's attempt to hold back the tide. An additional factor to note is that libraries more than other types of organizations in the academic-literary-reader world seem to lend themselves particularly well to automation. Many of their major functions, such as ordering, cataloguing, circulation and to some extent information retrieval, are easily routinized and therefore suitable for computerization. In such a situation, what are the possible organizational responses for the libraries of the developing countries?

There are many approaches to computerization that can be identified. However, for the developing countries, there are essentially two possible approaches. In the first approach, computerization is undertaken independently by the library without reference to other libraries in the country. This may be termed the "go-it-alone" approach. In such an approach, the system could be developed in-house (either using a library dedicated or an institutional computer), or farmed out to a commercial bureau, or the system could make use of an existing software package. In the second approach, the system is developed jointly in a resource-sharing environment. In this approach, which may be called the consortium approach, the system could be developed by one of the consortium members on behalf of the others, or could be developed on a joint basis through team effort; alternatively, the system could be farmed out to an outside contractor or the participants could agree to use an existing software package. There are both advantages and disadvantages in the two approaches.

In the go-it-alone or independent method, there is the advantage that the institution concerned can direct the resources to meet its own priorities. There may also be certain unique features which only an independent approach can meet. Since users can be intimately involved with the design of the system that they will ultimately use, this has the added advantage of user commitment. Communication between the designers and users is also facilitated.

The possible disadvantages of the independent approach are the constraints imposed by the local computing environment, and, without adequate in-house expertise, the risk of mismanagement. Higher costs may also be expected in some situations. Certain kinds of library operations are more suitable for the independent approach than the consortium approach, as for example, in the automation of acquisitions and circulation activities, where the data to be processed tend to be unique to the institution concerned. In a situation where there is a desire to share in the use of data, such as cataloguing and information retrieval, the consortium approach appears to be more advantageous.

Whatever the approaches adopted there are bound to be problems as well as organizational changes involved. Rather than deal with these problems and changes on a theoretical level, I propose to use an actual case study to discuss these problems and changes. The case study concerned relates to the implementation of the MALMARC system in Malaysia. Although the consortium approach was used to develop this system, and although some of the problems and reorganizational demands are different from those that would arise in the "go-it-alone" approach, many of the problems and reorganizational demands are similar to those that would arise when any automation programme is implemented.

THE MALMARC SYSTEM

The MALMARC system is a computerised cooperative cataloguing system developed at the Universiti Sains Malaysia for the MALMARC Consortium, comprising all the local university libraries and the National Library of Malaysia. I do not intend to go into the details of this system, since it has been well documented in an earlier article (Lim, 1980). Very briefly, the system selects records from the British and Library of Congress MARC tapes as well as the Malaysian union catalogue data base for the participating libraries on the basis of control numbers (e.g. LC card numbers or ISBNs) sent to the MALMARC Coordinating Centre at the Universiti Sains Malaysia. For unmatched control numbers, original cataloguing data are input into the system and machine-readable cataloguing records are created also at the Universiti Sains Malaysia. The system maintains the institutional files of the participants and produces cumulated COM (fiche) catalogues, accessions lists and other products for the participants at regular intervals. The union catalogue data base that is produced as a byproduct of the system now includes about 160,000 MALMARC records and this is growing at the rate of 60,000 records per annum. The current participants of the MALMARC systems are the National Library of Malaysia, the University of Malaya Library, the National University of Malaysia Library, the University of Agriculture Library, the Universiti Sains Malaysia Library, and the Nanyang Technological Institute in Singapore.

In the course of the development of the MALMARC system, many organizational and developmental problems arose, and for convenience these will be dealt with at the macro and micro levels.

ORGANIZATIONAL PROBLEMS AND CHANGES AT THE MACRO LEVEL

The success rate of an organization in adapting to technological change is to a large extent determined by the characteristics of that organization as well as by the people that run it. Organizations which are non-traditional and run by entrepreneurial types tend to be more innovative than those run by more traditional types with a strong preference for highly structured and bureaucratic ways of doing things. Most conventional libraries, unfortunately, may be termed traditional in terms of their authority structure, technical apparatus and the values of their librarians. Robert Presthus in his detailed study of the "accommodation potential" of libraries and librarians to technological change (Presthus, 1970) has argued that because libraries are highly bureaucratic structures they tend to have an anti-change bias. He compared the structure of libraries with the ideal type bureaucratic model designed by Max Weber around the beginning of this century, and concluded that many similarities exist. The following characteristics which are typical of a bureaucratic structure are also to be found in many libraries:

(a) Authority rests on a legal and rational basis rather than on traditional or charismatic bases (i.e. authority does not rest on the weight of custom or tradition (traditional authority) or on the personal qualities of the leader (charisma)).

(b) Libraries, like many bureaucracies, tend to be structured hierarchically, in which authority is centralized and maximized at the top, and contracts as one descends the hierarchy.

(c) Library jobs tend to be highly routinized. Operations, recruitment, promotions are based on systematic rules, administered impersonally and impartially to achieve prescribed, limited and extrapersonal goals.

Such a pattern of organization tends to be highly resistant to innovation "since each successive level of authority becomes a veto-point for proposed innovations arising from below." (Presthus, 1970, p.21). This bureaucratic nature of libraries in fact constitutes one of the major organizational problems at the macro level. Any effective change can only be achieved successfully if it is imposed from the top. It is therefore important that the top leadership in the bureaucracy be persuaded of the value of the technological change before it can be successfully implemented.

The experience of the MALMARC system, to a large extent, confirms the accuracy of this view. Until the relevant library administrators were convinced of the value of the system, it was very difficult to obtain the necessary cooperation to implement the project successfully. It is pertinent to note, for example, that although all the local university libraries participated in the pilot experimental project, three of the institutions pulled out of the system as soon as it become operational. Two of these three institutions eventually rejoined the system, but only after a change had occurred in the library leadership. One institution remains a non-participant even though all the subordinate staff from the Chief Cataloguer down would like the library to participate in the MALMARC system.

Another problem area at the macro level relates to the inter-organizational relationships of the participating libraries. Because the system was developed by one of the participants, namely, the Universiti Sains Malaysia, considerable care had to be taken to ensure that a structure was evolved which would be acceptable to all the participants. A great deal of diplomacy had to be exercised to quell fears of Universiti Sains Malaysia's dominant role in the development and operation of the system. This problem is made all the more complex by the fact that the Universiti Sains Malaysia Library is neither the largest library in the consortium nor is it the National Library. During the developmental phase of the MALMARC Project, all the decisions were taken at the meetings of PERPUN (a Malay acronym for Conference of National and University Libraries in Malaysia) an informal forum of chief librarians with a rotating chairman. This forum could be used because membership of the MALMARC Consortium during the developmental phase of MALMARC coincided with the membership of PERPUN. It had the added advantage of ensuring that the Universiti Sains Malaysia did not appear to be the dominant partner in the project.

One of the difficulties of evolving a suitable cooperative structure stems from the fact that academic libraries have always prided themselves on their autonomy, and librarians have for a long time sought to provide comprehensive services to their clientele with minimal reliance on outside institutions. To design a new organizational structure which removes some of the autonomy from the individual institutions is very difficult. There are legal as well as financial problems to surmount. As Battin has pointed out:

> "It is extremely difficult to move from an established structured environment to a highly volatile arena in which both the decision-making and the accountability processes have become diffused. Any organizational change requires a highly developed ability to cope with ambiguity, to work effectively in an uncertain environment, and to design and create new organization structures in the process of change. This is the challenge for the manager of the transition process as we move from inertia through chaos into a productive equilibrium." (Battin, 1980, p.58)

Four years have passed since the MALMARC system has become operational. But we are still struggling to find a suitable organizational framework for the system. The legal and financial obstacles towards the creation of an independent organization to run the MALMARC system have yet to be solved. For the time being, therefore, the MALMARC system is run as an extension of the Universiti Sains Malaysia Library's operations. However, policy matters are decided by a Consortium of the participants.

The ultimate goal is to transfer the MALMARC system to the National Library of Malaysia which will then run it as a national system. Until that day arrives, the Universiti Sains Malaysia will continue to run the system and make whatever improvements necessary from time to time. To prevent fissiparous tendencies, we have been extremely cautious not to adopt a big brotherly attitude towards the participants of the system.

A final problem that we are facing at the macro level, and in a sense, this is a problem that is common and inherent in all projects developed by an outside body, is the difficulty of getting the participants to be more actively committed to the system, and to be more careful about the quality of the data input into the system. Within each of the institutions, the remoteness of the system makes it hard for the staff to feel committed to it. There is also the feeling that any errors in the data made will be picked up during the processing stage at the Universiti Sains Malaysia. One possible solution is to decentralize as much of the processing as possible, and we are currently carrying out experiments with microcomputers to find out to what degree processing can be decentralized. This step is necessary not only to provide the participating institutions with a greater sense of involvement in the system, but also in recognition of the fact that most of the traditional activities of a university library have been developed and refined in an environment of institutional autonomy. The greater the degree of decentralization, the more closely knit the MALMARC participants will become. This is one of the ironies of cooperation.

PROBLEMS AND CHANGES AT THE MICRO LEVEL

The major problem at the micro level relates to staff reaction to the introduction of automation. The evidence appears to be mixed here. Presthus in his study of the "accommodation potential" of librarians in North America to technological change has concluded that although "most librarians react positively to the prospect of automation in its several forms..." actual findings show that "two thirds of the librarians have a generally ambivalent reaction, ranging from 'reluctant acceptance' to a 'wait-and-see' posture." (Presthus, 1970, p.107).

There appear to be two major reasons for this. The first is related to the potential of the computer to disrupt well-established and comfortable modes of work and thought in the library field. This potential may be seen in several areas. Certainly, the role of the cataloguer becomes precarious as a large proportion of the cataloguing can now be taken over by clerical level personnel. Similarly, the autonomy to make cataloguing decisions independently by the Chief Cataloguer is threatened. Since the cataloguing data has to be shared, all decisions have to be standardised for the common good.

The second reason stems from the peculiar nature of librarianship which does not seem to attract very innovative or entrepreneurial types. As Presthus has shown: "Not only are most librarians educated as undergraduates in the humanities and social sciences, which are often unsympathetic to quantification and scientific method, but they seem to have some personality attributes which are inapposite to a felicitous acceptance of change and innovation." (Presthus, 1970, p.108).

Our experience with the MALMARC system also shows a mixed bag of reactions and no single view appears to be conclusive. On the one hand, there were librarians who embraced the new technology enthusiastically; on the other there was some very serious resistance to the introduction of the MALMARC system and any cooperation that was given was given rather grudgingly, if at all. The key to the success of the system was the Chief Librarian, who represented an important agent of change. Where the Chief Librarian concerned was enthusiastic about the system, he was able through the weight of his authority to drag his staff, however reluctant, along with him.

On the whole, however, staff resistance, although present, did not pose a serious obstacle. This may be partly attributed to the fact that none of the staff felt that their jobs were threatened. Secondly, there were changes in the job content and work relationships of some staff. Because the new technology has the capability of absorbing some of the more routine tasks, it was possible to design more meaningful jobs. Most of the job changes were at the level of the clerk and the typist. Many of the clerical staff were retrained to become cataloguing editors, while the typists were retrained to become keypunch operators. An informal interview with all the clerical and typing staff involved in these changes subsequently revealed that there has been a considerable increase in job satisfaction and pride in their work. For the senior staff too, involvement in computerization has improved their standing within the university community and provided some image-boosting. Finally, many training courses were conducted to propagate understanding of the MALMARC system and this had the effect of increasing staff appreciation of the power of the computer as well as reducing their fears of the machine.

Although a limited number of professionals continue to refuse to have anything to do with the computer, the majority have been easily won over. And contrary to expectations, there has not been much difficulty in training the cataloguers of all the participating libraries to input data according to the MALMARC bibliographic format. The development of the format itself did not take up too much time since it was based on the Library of Congress and British Library MARC formats with local adaptations.

There have also been changes in the work procedures of the cataloguing departments concerned. A flowchart of the new work procedures was developed at the Universiti Sains Malaysia and introduced in the participating libraries. The transition from the manual to the automated

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system was carried out relatively smoothly although there were some initial problems, chiefly stemming from the inability of participants to follow the rigorous work schedules demanded by a machine-based system.

Based on the experience of the MALMARC system, there does not seem to have been very marked changes in the organizational structure of the libraries occasioned by the introduction of an automated system. Current research on the relationship between organizational structure and technology has also not been very conclusive. There is, however, no doubt that electronic technology tends to centralize decision-making and foster centralization. Because automation tends to cross traditional divisional frontiers, some form of coordination is necessary to achieve organizational integration. We have tried to achieve this through the appointment of a Coordinator.

In the library literature, the appointment of a Coordinator has often been criticised as being ineffective because the Coordinator frequently lacks commensurate authority and role definition leading to feelings of frustration, ineffectiveness and positional anxiety. This difficulty is compounded by the fact that the Coordinator is frequently little more than a post-box transmitting information back and forth between more powerful managers. We have tried to increase the powers of the Coordinator by giving him or her the authority to make decisions. But ultimately, the selection of the right person with the interpersonal skills to resolve difficult conflicts will be equally important.

CONCLUDING REMARKS

Libraries and librarianship now stand at the crossroads because of the development of the new information technology. To some librarians, the new information technology represents a threat that will not go away. To others, it represents a new opportunity for librarians to expand the area of their expertise and as a consequence increase the independence and prestige of their profession. Looking into the future, I believe that automation will allow the librarian to design new organizational structures and procedures for the "library of the future" which will no longer be book-based but instead will be a central repository using "a combination of computer storage, microreduction, remote transmission of information, from which information could be extracted by a suitable interactive search process. In each case, a variety of linguistic, processing, and display tools would be used to establish appropriate connections between the customers and the corresponding relevant information items." (Salton, 1975, p.12)

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The Application of Automation to the Library Processes of the National Autonomous University of Mexico

by

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THE APPLICATION OF AUTOMATION TO THE LIBRARY PROCESSES OF THE NATIONAL AUTONOMOUS UNIVERSITY OF MEXICO

ABSTRACT

This paper sets forth the general and relevant aspects of the automated processes as applied in Mexican university libraries. Discussed are four case studies of systems which - were developed at the National Autonomous University of Mexico and which determine the infrastructure of the automation processes as applied in university libraries throughout the - country. The principal representative example cited is the bibliographic system called LIBRUNAM, which handles cataloging processes. Also discussed are: the automated System UNAM-JURE which is utilized in studies made of Mexican legislation, - and the automated system of the Institute of Anthropological Investigations which is used for bibliographic processing as well as in the anthropological research carried out within - the Institute. Finally a broad outline of the automated - system of the Scientific and Humanistic Information Center is presented; this system serves primarily to facilitate in the acquisition of periodical publications for the 165 libraries that make up the library system of the National University.

THE APPLICATION OF AUTOMATION TO THE LIBRARY PROCESSES OF THE NATIONAL AUTONOMOUS UNIVERSITY OF MEXICO

INTRODUCTION.

The application of automation in Mexican university libraries is a recent phenomenon, the processes having been sistematycally used only since 1975. At present, the fact that a high percentage of Mexican universities possess computers (used above all for administrative functions but employed for academic-scientific uses as well) has provided the possibility for university libraries to utilize computing facilities for specifically bibliographic functions, most importantly for loan control, design and implementation of data banks, and use of foreign data banks.

Although in Mexico certain libraries are not a present able to take advantage of the computer resources of their own universities, this lack can be partially overcome by using the connection available with 400 foreign data banks by teleprocessing through the SECOBI (Consultation Services to Information Banks) node of the CONACYT (National Council of Science and Technology). This node provides Mexican libraries access to the following foreign systems: ORBIT, Dialog, New York Times, Data Resources, Bibliographic Retrieval Services, Questal

G'CAM, Sligos, and CISI.

The possibilities for designing data banks and for utilizing foreign banks depend basically on economic considerations. There have been various attempts to create automated information systems within Mexican university libraries and, although some of these projects have had to be delayed or abandoned for economic or political reasons, nevertheless, within the radius of activities of the National Autonomous University of Mexico there are now in operation various data banks which have become important instruments in the functioning and development of the institutions which created them.

The use of automation in the bibliographic activities of the National Autonomous University of Mexico is the subject of this paper, which will undertake to describe the most important data banks now in operation within the University.

DESCRIPTIVE FRAMEWORK.

The National Autonomous University of Mexico comprises: five faculties and schools in which are offered licenciate masters, and doctorate degree programs; thirteen preparatory schools located in various parts of Mexico City; five national schools for professional studies; and fifty-two institutes and centers for investigation. These dependent institutions have their own libraries which provide bibliographic services in total to 315,000 students, 20,000 teachers, and 15,000 research persons. As these facts indicate, the University is large and complex, and thus the library must of necessity be complex.

The acquisition of periodical materials and the acquisition and processing of monographic materials are controlled - and managed by two institutions: the General Library Administration coordinates the acquisition and technical processing of monographic materials, and the Center of Scientific and Humanistic Information that of periodical and serial publications. Following is a description of the most important characteristics of the automated systems of each of these institutions as well as of the data banks used for legislative and anthropological investigative research within the University.

GENERAL LIBRARY ADMINISTRATION.

As mentioned previously this Administration coordinates the acquisition and technical processing of monographic materials. It provides services to the 165 departamental libraries that make up the University Library System. The total collection of this system is the most complete in Mexico; it comprises at present 2,000,000 volumenes, a number which increases by 120,000 volumes each year.

The great quantity of new material acquired by the General Library Administration, together with the urgent need to facilitate the technical processing of books, required that an investigation of automated library systems by undertaken in order to determine how to make maximum use of automated bibliographic processes for the benefit of the University as well as of other institutions, both national and foreign.

The first investigations, begun in 1974, determined that the data base would be designed on the basis of compatible modules which would form an integral system of bibliographic information. In 1978 the automated system known today as LIBRUNAM was offically inaugurated.

What is LIBRUNAM?

LIBRUNAM is a bibliographic system organized in modules for on-line retrieval, that includes routines to facilitate the acquisition and technical processing of books. It permits, in addition, the duplication and development of sets of catalographic cards according to Angloamerican Cataloging Rules. It prints forms for payment to book distributors and develops bulletins of new acquisitions. It allows for the creation of indexes by author, subject heading and classification and, on COM, manages the departments that are part of the system and controls the quality of the data bank through statistics.

STRUCTURE OF THE SYSTEM.

The LIBRUNAM system comprises in total nine modules:

1. TECHNICAL PROCESSES MODULE, 2. ACQUISITION MODULE.
3. INVENTORY MODULE, 4. AUTHORITY LIST MODULE, 5. LIBRUNAM SERVICES MODULE, 6. AUTOMATED CIRCULATION SUBSYSTEM MODULE (SAC), 7. THESIS MODULE, 8. PERIODICAL PUBLICATIONS MODULE, 9. DIRECTORY MODULE.

Of the nine modules only three are at present in operation.

The other six either remain in the design stage or have - been delayed in their development by a lack of human and technological resources.

In this paper only the Technical Processes Module will be - discussed in terms of general structure, as it is the nucleus of the LIBRUNAM data base.

TECHNICAL PROCESSES MODULE.

CHARACTERISTICAS OF THE INFORMATION.

The LIBRUNAM data bank contains cataloging entries of bibliographic material the nature of which is determined by the variability, in terms of frequency and content, of the information. The basic elements that a cataloging entry in the LIBRUNAM data bank contains are: classifying number, LC/title register, author, title, publisher, edition, physical description of the book, series, ISBN (International Standard Book Number), bibliographic notes, material heading, coauthors, local card number, departmental library code, and acquisition number.

CODING AND FORMAT OF THE SOURCE DOCUMENT.

The coding of the bibliographic information is done on the basis of the MARC II format for monographic materials; one sheet is used for each work to be coded, this with the object of avoiding omissions and other errors. The majority of the tags appear either partially or completely in printed form; classifiers add the necessary information. The fixed-length fields and the tags belonging to the MARC II format that were considered necessary for the cataloging of the books acquired by the UNAM were selected. A set of simplified symbols relating to the source information was designed in order to facilitate the coding and retrieval routines.

The fixed-length fields have twenty-nine tags taken form the MARC II format, and these include all the information to be found in a cataloging entry as well as three internally- constructed tags used for production and statistic control.

VALIDATION OF INFORMATION.

In order to assure the desired high cuality of information in the data bank, LIBRUNAM implemented a very strict data filter with the object of refining information to the maximum degree and reducing errors to a minimum. The filter revises and validates the construction and syntax of the data, guaranteeing thus that the information can present only orthographic and conceptual errors which, though not detectable by the - system, are correctable on-line.

PROCESSING FOR ON-LINE RETRIEVAL.

On-line retrieval is the process most used in the LIBRUNAM system.

Both the design of the archives and the programming for processing information to be registered in the data bank were carried out in such a way as to assure that this module be the most efficient possible.

It is believed that these routines will allow the user to employ the system to the greatest advantage and at the same time minimize the need for equipment.

The program was designed to work simultaneously with various terminals and with those of various types: with printing terminals, with display terminals, intelligent terminals, etc.

The information can be retrieved on-line by direct access according to any of the elements that make up the cataloging entry or any acombination of these: author, coauthor, title, publisher, subject, series, DGB card number, ISBN, LC classification. Information can also be retrieved by the free access mode, that is to say, by means of a word used in the body of the entry.

A special information retrieval mode is the phonetic with which information can be obtained even when the word requested has been written with mechanical and orthographic errors.

As an aid in technical processing the data bank is used on-line in the precataloging processes and in the assigning of subject headings.

The complete LIBRUNAM system is programmed in Algol, which creates flexible archives with sufficient information to facilitate a complete retrieval and at the same time saves the maximum amount of fixed and virtual memory space to accomodate the large volume of information that it handles.

LIBRUNAM is run in a time-sharing mode on a Burroughs 6800 computer which handles the following processes: information storage, printed output, production of microfiche, data bank control, and on-line retrieval.

At the present the LIBRUNAM data bank contains 270,000 bibliographic entries stored in 800,000 segments. The bank is brought up to date weekly, 2000 titles being added each time. The average cost of the programs for the design of the data base, all of which were carried out in the institution itself, was $212,766.00 U.S. At the present time the system is working with eighteen terminals of the following types: two Superbees, two Decwriters, six Applied Digital Data Systems (ADDS).

The maintenance and use studies of the system were made by - eight specialists in automation and by the personel of the various departments involved with the LIBRUNAM system.

THE UNAM-JURE AUTOMATED INFORMATION SYSTEM.

The UNAM-JURE Information System is an on-line retrieval system which handles information about Mexican legislation. Its main objetive is to aid in investigative work and in the teaching of Mexican legislation within the National University. The System is being developed by the Institute of Juridical - Investigations of the National Autonomous University of Mexico in collaboration with the Institut de Récherches et d'Etudes por Traerament de l'Information Juridique (IRETIJ) de Montpellier, France.

GENERAL CHARACTERISTICS OF THE SYSTEM.

The System uses the Burroughs 6700 computer owned by the UNAM on a time-sharing mode. It will have a fixed storage capacity of 45,000 segments and a changeable storage capacity of 500,000 million character. It uses two Applied Digital Data System (ADDS) terminals for on-line retrieval an two Decwriter printers for information output. It is used on-line and utilizes the Algol language. Through its advanced programming for the construction and management of archives it achieves rapid retrieval, reliability, and maximum equipment use. It is important to make note of the fact that the computer programs were developed by the institution itself and that they are to be found documented in their entirety, which guarantees the - use and operation functioning of the System.

AUTOMATED SYSTEM OF THE INSTITUTE OF ANTHROPOLOGICAL INVESTIGATIONS.

The Institute uses for its automated processes the package of programs known as ONIONS. ONIONS utilizes a main data bank, the elements of which are bibliographic references; these references in turn consist of sub-elements which must satisfy certain requirements relating to the storage and retrieval of the information. One of these elements is the source document which is codified according to fixed and variable length fields. In order to make optimun use of the package the - Institute of Anthropological Investigations has made modifications and adaptacions.

The adaptacions.

The system has been adapted in accordance with the norm of - giving greater attention to the quality of the information than to the capacity for handling a great quantity of data.

A Burroughs 7800 computer is used, under the shared time mode. It handles 1,000,000 segments of changeable storage.

It uses an Applied Digital Data System video terminal and a Decwriter printer for on-line retrieval and printed output. The program language used is Algol. In relation to the coding format, it is important to point out that in spite of the modifications effected to increase the usefulness of the package, it still has a balanced format to fulfill the required needs of fixed and variable length fields. At present the bank stores 300,000 catalographic entries, primarily books, periodical - publications, documents and maps. The bank is brought up to date weekly; the production is listed in alphabetical order by author, title, main subject and bibliography, according to the KWIC technique. Although the system is intended mainly to be - used within the University proper it offers services to Anthropology schools throughout the Mexican Republic.

AUTOMATED SYSTEM OF THE SCIENTIFIC AND HUMANISTIC INFORMATION CENTER (CICH).

The system is operating with a Digital PDP 11/40 minicomputer that belongs to the Center. It is handling at present about 250 million characters in changeable storage and is expandable according of the requirements of the institution. It uses - fourteen Digital video terminals for information storage and - retrieval, which can be made on-line or off-line. It also uses two Digital printers for printed output. The program language used is BASIC PLUS. The programs were developed completely - within the Center. The structure of the system is based on the management of isolated archives. Since each archive uses the - information for specific purposes the present system can not be considered to be a base structure. Nevertheless, the program - goals and technical base are being reevaluated so that in the - near future a multi-use data base can be created. The present system is run according to the menu technique; that is, information from the various archives is selected and arrangel hierarchially for storage and retrieval.

The CICH has automated the following subsystems: 1) Catalog of Periodical and Serial Publications. 2) Analytical publications - and catalogs which comprise the following categories: a) Clase (Citas Latinoamericanas en Sociología, Economía y Humanidades), b) Periódica (Indice de revistas Latinoamericanas en Ciencias), c) Bibliografía Latinoamericana I and II.

The Center also utilizes a connection with various foreing data banks in order to carry out retrospective bibliographic investigations; these consist of the compiling of bibliographic references to specific subjects. These references are retrieved from more than 150 automated data banks by means of processing through the SECOBI node which connects with 400 data banks located in various parts of the world.

CONCLUSION.

Automation as applied in Mexican university libraries is a - direct response to the need to offer adequate information services. Within the National Autonomous University of Mexico - the storage and retrieval of information through automated - processes reflects a preoccupation with the creation of suitable mechanisms to fulfill demands for documental information on the part of 315 students, 20,000 teachers, and 15,000 research persons - these the potential users of the 165 departmental libraries that make up the Library System of the University. Looking at it from another point of view, since the National University is the largest and most important in Mexico it seems appropriate that it develop cooperative agreements - with the state university libraryes, as well as agreements on the international level.

That UNAM has the necessary automated infrastructure to do so is reflected in the description of the systems; these systems should now be oriented in such a way that they can be used to the best advantage and to their maximum potential.

In the context of Mexico and Latinamerica, the LIBRUNAM data bank represents a rich source of information. (Generally the cultural wealth of a country is to be found localized in its university libraries, as born out by sample studies made in the Universities of San Luis Potosi and Sonora in Mexico, in the universities of Columbia - through the ICFES (Instituto Colombiano de Fomento a la Educación Superior), and in the Catholic University of Chile).

Since the LIBRUNAM data bank not only supports the work of bibliographic consultation, but also helps in the technical processing of bibliographic materials, this automated system can aid other university libraries throughout the Mexican Republic and in other Latinamerican countries by means of a cooperative system which permits the participating universities to share information through a network backed up by an adequate computer infrastructure.

From the technical point of view, the LIBRUNAM system could operate on the level of a local, regional, or international network. However, it would require a strong infrastructure of computing equipment, be this based on the computer now used on a time-sharing basis or on the acquisition of other suitable equipment.

Full advantage should also be taken of the automated systems of the UNAM-JURE, the CICH, and the Institute of Anthropological Investigations, since the information compiled by them, which is of undoubted value to specialists in these areas, is at present available only to researchers within the Institutes themselves.

In order to utilize national and foreign data banks it is indispensable to plan on using the medium of telecommunications.

In Mexico the Communication and Transportation Secretariat has through the Telecommunications Agency dealt with the need for data transmission services by means of private telephonic channels. The Secretariat has also begun the job of structuring a telecommunication network based on the experiences of the ARPA (Advanced Research Projects Agency) and the SITA (Société Internationale de Télécommunicationes) net wokrs.

Up until now the Communications and Transportation Secretariat has been working the transmission of bibliographic information by means of the SECOBI node, thus permitting students, profesors, reseachers, and teaching and research institutions access to the information contained in different data banks.

It can be deduced from the panorama presented here that there - exists an awareness of the benefits to be gained in terms of - time, opportunities and topicality from the services of data - banks for information retrieval. The possibilities for future growth in the use of these banks will depend on the service - costs, the availability of budgeted funds within Mexican institutions, and the cost and facility of telephonic or satellite communication provided by the Mexican Government and by the - telecommunications network developed by the Communications and Transportation Secretariat.

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Using Automated Systems for Scientific and Technical Literature Searches

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ABSTRACT

For the foreseeable future, developing nations will be dependent on the industrially advanced countries for scientific and technical information. This paper attempts a description of the present state of the use of automated systems for literature search in the advanced countries, and examines some of the problems.

An assessment of the use being made of existing systems by developing countries is followed by proposals which, if implemented, could enable developing nations to benefit from information technology sooner than later. These proposals include the development of National information policies and the accelerated provision of telecommunication infrastructures.

Modern computer and communications technology (now collectively referred to as Information Technology) have had an enormous impact on man's capacity to gather, organize, store, retrieve and disseminate vast quantities of information. These technologies offer great promise for even more efficient and effective delivery of information in the most useful and usable formats[1].

Information, and especially scientific and technical information, is vital for national planning and development. Unfortunately this vital role of information has not been realised in many developing countries.

As recently as March 1983, the Commissioner of the European Economic Community responsible for relations with the so-called African, Carribean and Pacific nations, stated that developing countries are now even more dependent on the industrially advanced countries than they were during the colonial period. This dependence is more manifest in the area of scientific and technical information. It is estimated, for instance, that about 90% of the world's literature in science and technology is produced in the industrialized countries, mostly in the half a dozen or so top countries[2]. It is in these half a dozen countries that search tools and data bases are concentrated. For developing countries to have access to scientific and technical information, they must, for the foreseeable future, be dependent on the industrialized nations. To facilitate this access, scientific researchers and information workers in developing countries must be familiar with the state of information activities in the industrialized nations at any given time. At the same time the developing countries will need to accelerate the acquisition of the necessary information infrastructures if they are to aspire to even a small measure of independence. In the area of information technology, there are very few climax technologies, the majority being changing or intermediate technologies[3].

2. THE USE OF AUTOMATED SYSTEMS IN SCIENTIFIC AND TECHNICAL LITERATURE SEARCHES: A BRIEF OVERVIEW

In determining the boundaries of discussion of this subject I have noted that earlier papers in today's programme have dealt with

a) A state of the art review of new information technologies available in the industrialized world.

b) The relevance of foreign data bases in a university library in a developing country.

I am aware, therefore, that there will be a certain degree of overlap between the present paper and those papers. I shall however endeavour to restrict the overlap.

Part of the reason for any overlap is my perception of an automated system for literature researches. I distinguish automatic indexing and abstracting from automated searches. The automatic system, in my understanding, makes it possible for an automated search to take place. I shall therefore be dealing in this section, with the present use of on-line data bases for literature search in science and technology. I shall also examine some of the problems raised by this activity, and then propose solutions.

Access to scientific and technical literature through automated systems had its origins in the 1960's and 1970's when the major abstracting and indexing services such as BIOSIS, Chemical Abstracts, Index Medicus, and Physics Abstracts computerized their operations, and created machine readable tapes, as by products. A few years later, these A & I services began to sell their tapes and discs to bibliographic utilities such as Lockleed's DIALOG, SDC's ORBIT, and Bibliographic Retrieval Services (BRS). The only major abstracting and indexing service to create its own data base at the time was the U.S. National Library of Medicine, whose on-line service MEDLARS (Also MEDLINE) became generally available by 1965[4]. Even then, access to the MEDLARS data base was essentially off-line, by means of a network of MEDLARS regional centres in the United States. On line processing was introduced only in 1970.

During the past decade, the growth in data base and online search activities has been staggering. Major data base vendors have enjoyed growth rates of between 20% and 40% while estimated revenues for suppliers and distributors is expected to rise from$1,000 million in 1981 to $5,500 million in 1991[5]. MEDLINE is said to index over 20,000 articles a month, while over 1½ million searches are made on it annually[6]. There are now at least two commercially available full-text online systems which provide access to the full document online. These are Mead Data's LEXIS and NEXIS. LEXIS provides lawyers easy access to case laws, compilations of statutes, and other legal materials from Britain and the United States in full text, and online. NEXIS contains [illegible] and weekly magazines from the United States and Britain. Searches on the LEXIS data base are quite expensive, but the fact that 25,000 searches per day were being made on it in 1981 is indication that its users appreciate its usefulness[6,7]. LEXIS is intended for lawyers, and as a direct substitute for the printed book it is marketed directly at the individual user, though it could be accessed through a user organisation such as a library[8].

The advances which have been achieved in automated literature searches by access to vast amounts of information stored in data bases have been made possible by developments in computer, telecommunications, and related technologies[5,9]. According to The Economist, "Magnetic memory has fallen from 0.1 cents per bit of information stored in 1968 to less than 0.04 cents per bit today (ie. October 1981). Telecoms costs should also fall, with the introduction of more efficient satellites and of sophisticated techniques for cramming more information down the same telephone channel"[6].

There are four types of organisations involved in the provision of online search services: Data base producers, Online Vendors providing host systems, Information Brokers who undertake search services off-line and/or the delivery of documents, and User organisations (libraries, firms, etc). The diagram below illustrates the relationships between these organisations.

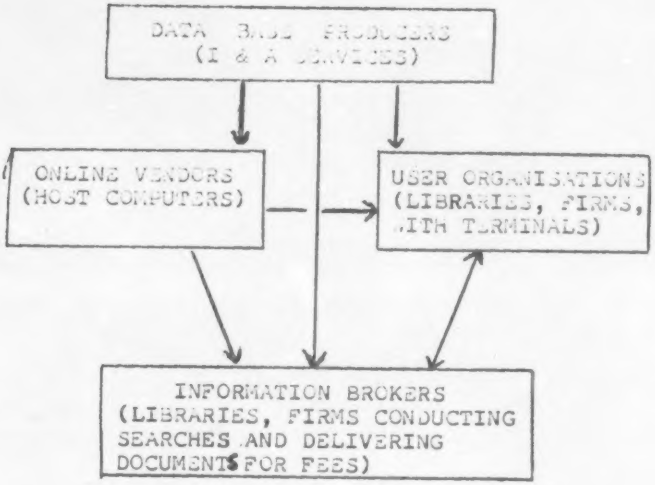

Figure 1: ORGANISATIONS INVOLVED INDDATA BASE HANDLING AND THEIR RELATIONSHIPS

Figure 1 shows that user organisations may provide searchers with direct access to a data base (eg. MEDLINE, LEXIS), or access may be achieved through a host computer provided by an online vendor. The searcher may also obtain access through an information broker whose function is to perform the search by direct access to a data base, or through an online vendor. The information broker may also deliver required documents.

The main business of indexing and abstracting services is to search the literature of a subject area for publication. The sale or lease of the magnetic tapes used in producing indexes and abstracts to a vendor for online searching is an additional source of income. The cost of creating and maintaining the data bases is met from the sales of printed versions of abstracts and indexes, but with the phenomenal growth in online searches, this may not be true for very long. According to Leigh Baker, there were over 1400 data bases accessible in Europe in 1981, 500 of them online. In the United States, there were over 600 data bases available through 90 vendors[5].

Put very simply, automated literature searches enhance reference work by providing instant, efficient and speedy access to vast amounts of data. But the speed with which this information is accessed should not lead us to ignore the real problems involved in online searches of abstracting and indexing services. Some of these problem are

a) The proliferation of data bases and host systems with different search commands and strategies.

b) The preparedness of intermediaries (Libraries)and users for the new systems.

c) Bibliographic versus physical access to documents.

d) The economies of online searches and the resultant effects on library finances.

3.1 PROLIFERATION OF DATA BASES AND HOST SYSTEMS

As we have already noted, there must have been over 1500 data bases in Western Europe and the United States by the end of 1981. We have also noted the forecast in growth, and the increasing number of vendors or host computers.

This proliferation in data bases and host systems creates a number of difficulties:

(a) Overlap in the coverage of data bases with the **concommitant** increase in the number of data bases consulted for any one search.

(b) Mastery of a number of command, languages and search procedures.

(c) Choice of host systems.

A number of solutions have been proposed for the problems:

(i) To reduce overlap, data bases for special subjects or disciplines should be created, to avoid the need to search several files[10].

(ii) Cross data base searching should be made easier by software modification[11,15], the acceptance of 1 or 2 familiar standard languages[12,15] or by the adoption of standards by systems operators[11,12,15].

(iii) A number of factors must be considered before selecting a host system, as very few organisations can subscribe to more than one or two systems. These factors include: user needs, number and relevance of data bases, speed and ease of access, costs, training facilities provided, availability of back up services, and flexibility of the system in terms of factors like "user friendliness" and document delivery services[illegible].

3.2 PREPAREDNESS OF INTERMEDIARIES AND USERS

Because of their ability to provide instant information direct to the inquirer, or end-user, it was thought that online systems would not require the service of intermediaries. However, the proliferation of systems and the naivety of the majority of end-users, has led to a situation where the majority of online searches are still performed by intermediaries. Creating awareness of data bases and their usefulness is one of the problems encountered by vendors and user organisations alike. Most data base vendors claim to have a "user friendly" host system which makes it very easy for the user to have the appropriate response from the system without too much fuss. But it is not entirely easy, as most of hte command languages now in use were developed for information specialists of an earlier period who processed information in the batch mode off line.

On their part, data base vendors provide manuals to go with their systems. In addition, training programmes at various levels are provided for nominal fees. DIALOG, for example, offers system seminars for new users, refresher courses for searchers with prior DIALOG experience, and search strategy seminars. There are also courses designed to train intermediaries and users in the techniques of search in specific subject areas and data bases[16].

Training programmes offered by data vendors are not generally available, and even if they were, the costs limit participation severely. This deficiency [illegible] the [illegible] or intermediary between the user and information sources. There is thus need for instruction in the characteristics and structure of data bases to be included in the curricula of library schools, with the additional provision for students to have hands-on experience at terminals[17].

3.3 BIBLIOGRAPHIC VERSUS PHYSICAL ACCESS

The vexed question as to the usefulness of bibliographic access without physical access to documents is one that has existed long before the advent of the so-called information society. At the end of every literature search, be it manual or automated, the next step is always to see desired documents. This problem now defined and expressed as document delivery has come into sharp focus because of the speed with which a large number of references could be generated from automated searches. The greater the volume of references, the more acute the frustration of not being able to have most of the documents for further work. Online vendors were faced at an early stage with the problem of providing online ordering of documents, following online searches.

Nearly every librarian knows about the photocopying service of the British Library Lending Division (BLLD) which in 1980 filled over one million orders for documents from its journal collections. Of these orders more than two thirds were from outside the U.K.[7]. Libraries turn to such organisations, only when they fail to meet requests from their own collections, or [illegible].

The point here is that document delivery is not a new problem. It has become only more urgent on account of developments in online data base technology.

The Institute for Scientific Information, a major publisher of A & I services, addressed this problem early enough, and its Original Articles Tearsheets (OATS) based on the over 6,500 titles indexed annually must be regarded as a forerunner of most of today's document delivery systems. OATS supplies users and librariaries with copies of articles in journals on request, and it was reported to have filled 150,000 requests in 1980[7,18].

The oldest document delivery service operated in conjuction with online services is SDC's Electronic Maildrop System introduced in 1975. Requests from users are channelled to major suppliers such as University Microfilms which then supply the desired documents directly. Major Libraries and data bank producers have also been used. More recently, DIALOG introduced DIALORDER for the supply of documents accessed bibliographically through its files. CANDOC, a Canadian online ordering service operates in conjuction with CAN/LE the national online enquiry system. The base for the service is the Canadian Institute for Scientific and Technical Information which meets requests from its resources or from 250 cooperating libraries[18].

In 1978, an attempt was made to speed-up document delivery through the British Library Automated Information [illegible]

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Loan Service was introduced. Users did not seem too enthusiastic about [illegible], mostly because many did not feel that the marginal increase offered as a result of the online ordering was worth it. In France where the Centre National de Recherche Scientifique (CNRS) introduced a similar service at the same time, use has increased five-fold, because there was no service like BLLD before its introduction[18].

All the systems just described are similar in one respect: they are merely channels for placing orders from suppliers who then mail required documents to users through normal postal channels. The gain in speed is thus marginal. One problem with these systems is that they do not include producers such as book and journal publishers in their chain. As such, they are dependent on repositories such as BLLD for their requests, and there are very few organisations like BLLD whether in size of collections or efficiency of delivery systems. The increase in online searches has led to users wanting more and more articles from journals not held by their libraries.

It is partly to meet this increasing demand for "separates" rather than complete journals, and partially to recoup income now being lost to photocopying of documents from agencies such as BLLD and CNRS that the major journal publishers conceived ADONIS (Article Delivery Over Network Information Systems). ADONIS aims at the storage of journals on video discs and issuing such journals as separates on demand[illegible]. [illegible], especially [illegible]

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journals and assist readers with obtaining separates on demand[19]. As at now, only Pergamon, Elsevier, Wiley, Blackwell Scientific and Springer Verlag are involved. For these publishers the success of ADONIS could mean loss of revenue as it has been suggested that the article delivery service alone could not meet the costs of creating and maintaining the data base[20].

Other similar experiments are: ARTEMIS: a European experiment for the use of fascimile transmission over the EURONET system; and HERMES a U.K. Department of Industry project based on the same principles.

In the long run, however, online fulltext systems such as LEXIS and NEXIS may provide the best solution to the problem of document delivery by simply eliminating it.

3.4 COSTS

One of the persistent problems of online searches is the increasing cost, exercerbated by the proliferation of data bases and hosts, and the complex pricing system for base royalties[21].

This situation has raised at least one serious ethical question for libraries: to charge or not to charge?

When a typical library user walks into a library to use the printed edition of say Chemical Abstracts, there is ordinarily no charge for this service. The only cost to the library (or user organisation) is the subscription already paid to the publisher directly or through [illegible]. The picture is very different. [illegible]

C[illegible] d [illegible] online, as

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shall see from figures 2 and 3.

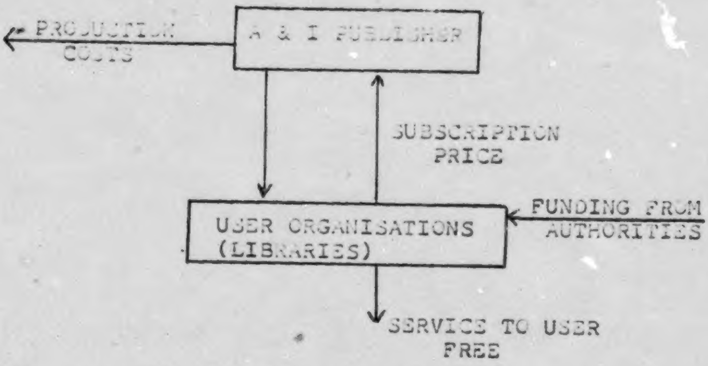

Figure 2: COST OF PRINTED INDEX SEARCH

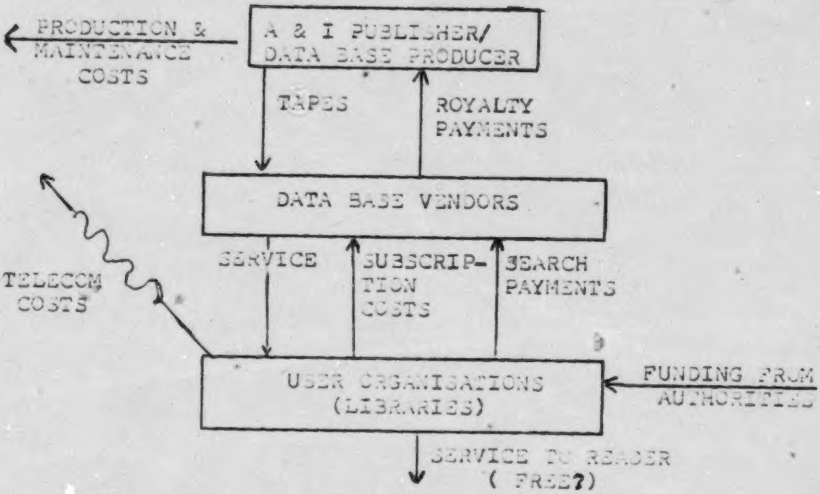

Figure 3: COST OF ONLINE SEARCH

N.B.: Arrows in these figures indicate directions of payments or services.

Figure 3 shows that for an online search, apart from the subscription or membership fees already paid by the library in order to have access to the service, there are at least two additional costs: the price of each search and the cost of dialing to the host computer. Document delivery, costs are not included in the configuration, because that particular charge is common to online and printed index searches. Also ommited in the figure is the cost of new equipment, staff etc, because these should be absorbed by the user organisation, and not passed on to the end user in any circumstances.

The results of a recent survey in the U.K. showed that "in general, free services are used proportionately more heavily than those services which try to recoup part of the cost, and these in turn are in greater demand than services which try to recoup the whole cost"[22].

So, there is no doubt that the use made of online searches in a library is affected by whether there is a charge for the service. It is difficult to say what a library should do as this is dependent on a variety of factors. The important thing is that online searches might lead eventually to a careful reexamination of the whole philosophy of free library services at any cost.

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4. THE PRESENT STATE OF ONLINE SEARCHES IN DEVELOPING COUNTRIES

Several terms have been used over the past centuries to describe the advanced and advancing nations of the world. In every age the term used is usually an indication of the intellectual and economic-political concerns of the world. Thus we have had variously the new world (the underdeveloped Western hemisphere), the colonies, the third world, underdeveloped countries, less developed countries (LDC's), developing nations, and the South. The terms most commonly used today are less developed countries, developing countries and The South. In the 1970's, the world was pre-occupied with the search for a new world economic order in which the industrially advanced North will show more consideration for the economically backward South. In the late 1970's, the movement was for a new world information order. The new world order envisaged had little to do with transfer of technical and scientific information. Its main concern was with NEWS and its coverage by agencies of the industrially advanced North and the economically backward South.

Perhaps, it is time for a new world information order with an orientation towards equitable distribution and availability of scientific and technical information. UNESCO, which played such a critical role in the discussions on the news information order, should initiate the procedure for a world conference. One must give UNESCO credit for its General Information Programme which has been working towards interlinked national documentation centres, However, one must confess that it is the commercial telecommunications networks and data base vendors who are making this excellent idea a reality.

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At the United Nations Conference on Science and Technology for Development (UNCSTD) held in Vienna in August 1979, a resolution was passed to establish a Global Information Network (GIN) for the benefit of the developing countries. The resolution of UNCSTD was eventually ratified by the General Assembly, but GIN is yet to take off. Some think that GIN is likely to be still born[23]. I believe that UNESCO's role should now be geared towards getting the commercial agencies to find ways of extending their services to developing countries.

Until there is a new technical and scientific information order, developing nations will continue to be disadvantaged in the world's exchange of information activities.

Not all developing nations are equally disadvantaged, however, when it comes to automated literature searches via online systems. Whereas some countries are already benefitting, others are just beginning to realise the importance of speedy access to the world's output of scientific and technical literature through online data bases. In the survey that follows, I have taken five countries or regions which are fairly representative of the levels of online search activities in the developing countries. There is a dearth of published materials on this subject, and I must accept that the survey could be out of date and unrepresentative.

4.1 BRAZIL

Compared to the rest of the developing world, Latin America, and especially Brazil, is doing very well indeed. Researchers in Brazil have access to the national information system SICON, as well as international services provided remotely through such vendors as SDC-ORBIT[24]. The Latin American countries have the

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necessary information infrastructures such as efficient and adequate telephone services and should not have too many problems. Other important factors in their favour include proximity to the United States, and a longer period of existence as independent nations.

4.2 INDIA

Considering the level of advancement attained by India in industry, higher education, and scientific research, one is surprised at the virtual lack of online search activities in that country[2,25]. India has a reputation for careful planning, and it should not be long before we learn of the adoption of online information retrieval systems in India. Already, INSDOC, by use of a computer located at the Indian Institute of Technology in Madras, provides a batch-processed SDI service covering about 0.5% of India's research scientists through access to Chemical Abstracts and INSPEC data bases[2].

4.3 KUWAIT

In Kuwait, MEDLARS is received by satellite. There is an online system between the Kuwait University Hospital and the U.S. National Library of Medicine[26]. It is not known if the satellite provides access to other data bases or host computers.

4.4 NORTH AFRICA

Automated information searches in North Africa have so far been mainly offline through the good offices of the Centre de Recherche Retrospective (CRR) in Marseille, France[27]. Most North African countries were once colonies of France. The CRR has also given advice to these countries in planning their own online retrieval centres.

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Here, the North African countries have the advantage of proximity to southern Europe just across the Mediteranean. Information infrastructures should thus be easy to instal.

4.5 NIGERIA

Of the five developing countries chosen for this survey, Nigeria has the lowest level of online information activity. There is no national information system, nor is there a national information policy to guide planners of such a system. This is despite the fact that Nigeria has been identified as a key link in the Pan African Documentation and Information System (PADIS) with headquarters in Addis Ababa[28]. National and international telecommunications links are poor. For any meaningful talk of automated search activities in Nigerian libraries, these shortcomings must be rectified.

For the past five years or so the E Latunde Odeku Medical Library of the College of Medicine, University of Ibadan has had with the help of grants from the World Health Organisation, access to MEDLARS in the batch mode. The searches are conducted at the NLM, and printouts of searches sent to Ibadan by mail. The service is heavily subscribed by medical researches, in spite of postal delays[29]. In February this year a data base vendor announced that it planned to hold a national seminar to demonstrate how host computers could be accessed through the network of Nigerian External Telecommunications (NET). Few weeks after the announcement, however, the NET building in Lagos was destroyed by a fire, and the seminar cancelled.

The Library of the Federal University of Technology at Owerri has initiated procedures for providing access to various data bases in the batch mode for its users. A number of Information on Demand Brokers indicated a willingness to assist with searches. The scheme has been delayed by a number of considerations, not least of which is the manner of payments for services which will be charged in foreign currencies.

5. DEVELOPING COUNTRIES AND ONLINE SYSTEMS: THE FUTURE

We have established in the course of this paper that access to scientific and technical information is essential for national development. We have also noted the impact of online systems on access to information and document delivery. If developing countries are to bridge the ever widening gap between them and the advanced countries in science and technology, action must be taken quickly to reorient their information services.

Data base producers are shifting their emphasis from A & I services in print form to magnetic tapes. One result of such a shift will be that pricing policies will soon favour the machine-readable form. Subscribers to print services will thus have to pay more.

The following actions are suggested:

(a) Formulation of National Information Policies.
(b) Establishment of National Information Systems.
(c) Rapid Improvement of Information Infrastructures

5.1 FORMULATION OF NATIONAL INFORMATION POLICIES

The first step towards formulating a meaningful national information policy is the establishment of an agency charged with the determination of the country's information goals and suggesting ways and means of achieving these goals. Thus, in the advanced countries, we find that

(a) The United States created the National Commission on Libraries and Information Science in 1970[30].

(b) The Ministry for Research and Technology of the Federal Republic of Germany was involved in the preparation of a *Programme of the Federal Government of Germany for the Promotion of Information and Documentation, 1974 - 1977*[31].

(c) Similar agencies exist in France, the Scandinavian Countries, the Netherlands, and Spain[31].

In creating such an agency, its roles must be clearly defined, in view of the likely conflicting interests between such departments or ministries as Education, Information, Science and Technology, and Communications. The national agency on information policy should thus have a coordinating role, and where governmental structure permits, there should be a full-fledged department/ministry with a minister of cabinet rank in charge. As many interests as possible should be represented on the agency.

The agency should organise regular national conferences to re-examine national policies in the light of new developments.

The national policy on information must address itself to the following:

(a) Identification and collection of existing resources.

(b) The place and impact of new technologies.

(c) The development of manpower for the national information system.

(d) Promotion of R & D activities in the information sector.

(e) Provision of information infrastructures.

(f) The extent of involvement of the private sector in the provision of information.

5.2 ESTABLISHMENT OF NATIONAL INFORMATION SYSTEMS

UNESCO which has been promoting the idea of National Information Systems (NATIS) gives one of the objectives of such systems as "to ensure that all engaged in political, economic, scientific, educational, social or cultural activities receive the necessary information enabling them to render their fullest contributions to the whole community"[32]. A national information system should thus be designed to fulfill the above objective, as well as those already identified in 5.1 above.

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A national information system should, in my view, have the following components in its structure:

(a) A national secretariat based at the national library or ministry of science and technology, and charged with the implementation of policies developed by the national agency on information and libraries.

(b) A network of information centres dealing with information in special subject areas or disciplines

(c) Each of the centres in (b) above should also be responsible for off-shore information activities in its discipline or subject, including access to foreign data bases.

(d) An inter-ministerial group to coordinate manpoweredevelopment activities and allocate funds for research and development.

(e) An inter-ministerial group to advise government through the national agency on information on the immediate needs for information infrastructures.

(f) A clearing-house based at the national secretariat to act as a mode for the network of centres in (b) above for the purpose of directing or re-directing enquiries, as well as the coordination of delivery of documents.

5.3 RAPID IMPROVEMENT OF INFORMATION INFRASTRUCTURES

No matter how carefully designed, a national information system cannot function without an effective telecommunications networks for the speedy delivery of information to users.

Most writers restrict information infrastructures to computers, terminals, data banks, etc. In my view, information infrastructures should include telecommunications systems which are prerequisites for the functioning of computers, data banks, electronic publishing and document delivery, etc.

Today, information may be in the form of sound, or it may be visual, or it may be digital data. Whatever its form, information must be converted into electrical signals before it is transmitted over a selected medium[9,32].

Developments in transmission technology have become so rapid and numerous that a country must be careful in selecting the system or systems most suited to its needs. Some old-fashioned telecommunications networks are incapable of managing some new information systems. There has been a suggestion, for example, that there is need to install new cable networks in Britain to make new systems such as teleconferencing possible[32].

Telecommunications networks are capital intensive and therefore expensive to create and maintain. The majority of developing countries cannot afford to upgrade their networks to the desired levels. For those countries which can, careful planning to establish priorities must be made.

For example, Nigeria has had for at least years, satellite communication which has facilitated a national television network, and enabled television viewers in Nigeria to watch major live events live[33]. That the application of this capability to information systems is only just being realized is a symptom of the defficiences in most developing countries.

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THEME:

"UNIVERSITY LIBRARIES IN DEVELOPING COUNTRIES:
STRUCTURE AND FUNCTION IN REGARD
TO INFORMATION TRANSFER FOR
SCIENCE AND TECHNOLOGY"

FUTURE TRAINING NEEDS

by

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FUTURE TRAINING NEEDS

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Abstract

The training of university library personnel to cope with anticipated and increasingly sophisticated information needs of university library users in developing countries is considered to be crucial to the success of development efforts by developing countries in the future. It is noted that the impact of science and technology has resulted in the proliferation of literature which researchers can hardly keep track of unless they use modern methods of information handling. Librarians as information intermediaries will need to learn and apply new techniques of information transfer. Methods of acquiring such techniques have been suggested.

Introduction

To start with, I would like to thank both IFLA and UNESCO for inviting me to participate in this 1983 Pre-Session "Exchange of Experience Seminar for Developing Countries" Seminar at which we hope to share some ideas on how university libraries in developing countries should brace themselves for the challenges of the transfer of scientific and technological information. Our political leaders in developing countries are primarily concerned with (a) improving our weak economies (b) raising our levels of educational and vocational training (c) increasing our agricultural productivity (d) improving our health care delivery services (e) creating the necessary infrastructure for industrial development.

These and many other facets of national reconstruction will be accomplished only if our decision makers are equipped with the requisite development oriented information which, in itself, will comprise a significant portion of scientific and technological information. University and other tertiary institutions of higher learning have a major responsibility of producing our countries' high level trained manpower on whose shoulders falls the task of undertaking or inducing structural changes in society.

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It is fitting that we should assemble here, today, to try and capture a glimpse of how tomorrow's university libraries in developing countries will be structured in such a way as to make them function as effective societal agencies for information transfer.

TRAINING NEEDS

I consider the question of future training needs for university library staff as being critical to the ability of university libraries in developing countries to play a pivotal role in facilitating the transfer of scientific and technological information for development. I propose to discuss the question of future training needs for university library personnel in developing countries under the following sub-headings:

1. The University Library in a Developing Country
2. The Impact of Modern Technology on Information Transfer and Implications for University Libraries in Developing Countries.
3. Future Training Needs
    - i. Academic Education
    - ii. Professional Education
    - iii. Continuing Education.

1. The University Library in a Developing Country

Since the theme of this Pre-Session Seminar centres on the role of university libraries as agencies of information transfer, I take it that I am addressing myself to the 'converted'. I shall not, therefore, discuss, at length, the objectives and functions of a university, let alone those of a university library. In order to give perspective to the question of future training needs for university library personnel in developing countries, however, it is necessary to comment briefly on the functions of a university library in this kind of set up.

A university's mission is to teach, conduct pure and problem-oriented research in order to discover new knowledge and to render a public service to society that creates it. A university trains high level manpower that applies the newly acquired knowledge to induce structural changes (development) in a country. In order to teach and to prosecute research a university needs a well stocked, well staffed, and well serviced library which functions, in essence, as a central academic nervous system in which the university's learning and research processes take place.

University faculty and library personnel work in partnership as facilitators of learning and research. By default, these two segments act in partnership as a corporate change agent in society. Unlike in developed countries, university libraries in developing countries tend to attract an appreciably large segment of the country's top cream of the library labour force. The library also tends to be better stocked than other types of library because most governments invest generously into educational institutions with a view to achieving accelerated educational development that provides the human resources needed to perform development tasks.

Because of its rich information resources, a university library in a developing country may often be assigned tasks that elsewhere might be confined to a National Library.[1] In Zambia, for example, our University of Zambia Library is designated the National Reference Library for Zambia. Our responsibilities go far beyond our immediate clientele comprising students, faculty, and other researchers. A university library in a developing country discharges an enourmous responsibility. Those who manage it should be adequately trained in order to ensure an effective library service.

2. The Impact of Modern Technology on Information Transfer and Implications for University Libraries in Developing Countries

Modern technology has produced a less understood (to most traditional librarians) moron called a computer which has found applications in librarianship. The computer has revolutionised the process of information transfer by producing 'datacrats' who have eliminated or simplified most of the repetitive but critically important library routines such as sorting, filing, indexing, abstracting, cataloguing, text editing (via word processors), document and information retrieval, acquisition, and information dissemination.[2] There is nothing novel about information transfer per se as it has existed since time immemorial.[3] Library personnel (in literate societies) have continued faithfully to fulfill their duty of linking the information seeker to the documents that contain information that is believed (by the librarian) to be potentially useful to him.

Laudable as the librarian's performance has been, it has been condemned by such critics as Weinberg who says that "an information system that stops short of transferring information from one mind to another is inadequate."[4] Weinberg is apparently expressing preference for an online information retrieval system that retrieves immediately usable (finished product) information instead of a bibliographic (information) data base that merely points to "potentially useful" documents that the end user still has to acquire, examine, and determine whether they are really "useful" to him or not. From the view point of cost and expected usage considerations, I do not envisage a large-scale establishment of online information retrieval data bases in developing countries in the foreseeable future.[5] Bibliographic information data bases will surely come and we are not very far from that.

The 'electronic prophets of doom' have repeatedly warned us that videotext text terminals will in the future supersede information systems as we know them today. The age-old medium of recorded knowledge, paper has been threatened with extinction in a paperless information society of tomorrow.[6] Some skeptics have countered that "paper refuses to go away in spite of the many references to a 'paperless society'"[7] Those who believe that the threat of paperless information systems is mere fairy tale for developing countries may be consoled by those who question the probability of such an eventuality. Nevertheless, we must not dismiss lightly the fact that developing countries are slowly and irreversibly moving towards a new world order dominated by the knowledge industry in which knowledge will be recognized as power. He "who knows" what will be more important than he "who has what."

Tell stresses that "the demands of the developing countries cannot be ignored any longer when it comes to the development of modern information systems".[8] We can ignore this development only at our own peril. O'Donnell's timely warning is worth reflecting upon as he points out that "those who cannot learn from the future are condemned to experiencing it".[9] What O'Donnell is saying, in essence, is that we need to think about some of the problems that we may have to face in the future in order to find ways of dealing with them when they finally are with us; otherwise we must be prepared to suffer the consequences of our unpreparedness![10]

Science and technology through their 'integrating and fragmenting'[11] effects on knowledge have created a surplus of information which has resulted in the proliferation of primary literature -- journal articles, reports, patents etc. Indexing and abstracting services can hardly cover the enormous range of recent literature; consequently the ability of the reseacher to achieve complete current awareness of the new literature has had to be compromised.

This trend will continue unabated. Computerised bibliographic data bases will (once they become a common commodity) make it possible for end users to perform their own simple interature searches but, as Simkins says, "they will turn to experts for more difficult, more complicated or more thorough searches".[12] University library personnel in developing countries will need to become knowledgeable information intermediaries in order to achieve effective information transfer from the containing media (documents, books, non-print media, magnetic tapes/discs/drums/videodiscs) to the user. They may be expected to abstract, index, interpret or evaluate the documents under their care in order to extract the necessary information instead of functioning as uninvolved scholar-librarians of the past decades.

It is clear from the foregoing that university libraries in developing countries will be expected to cope with increasingly more sophisticated and varied information needs of their heterogeneous clientele.[13] It is necessary, therefore, that we now address ourselves to the critical question of what sort of educational experience will be expected of those who will mediate the information resources of university libraries in order to facilitate the transmission and utilization of scientific and technological information.

3. Future Taining Needs

Most developing countries are severely handicapped with respect to the transfer of scientific and technological information primarily because they lack the people who are well trained in information science.[14,15] The majority of existing library schools in developing countries do not teach information science *per se* except, where this is done, as an optional course. This is hardly adequate. As far as the training of future university library personnel for information work is concerned, there are two aspects of the problem that need to be looked at. There is the academic and the professional components to such training.

But before we can consider what might be included in such a training programme, it should be noted that no one such programme can be prescribed as a panacea for all developing countries because each country has its own local conditions and manpower needs as well as its own conception of what can be performed by the planned information systems.[16,17]

(i) Academic Education

To the extent that the university library staff work in partnership with the faculty staff of a university in order to enable the university to function as an institution of higher learning, each university library should aim at acquiring a core of 'leadership level staff' with sound academic education. This should be at the university degree level.

It is on a sound academic background that one can build his professional educational experience. Any university library staff who lacks the necessary university level education is more likely than not to fail to establish a rapport with his teaching colleagues. This would tend to undermine his self-confidence which ultimately would impair his performance. The thorny question of academic status for university library staff is hardly worth debating if the library staff lack this sine qua non requirement.

Nobody can lay claim to professionalism if he lacks an understanding of the academic disciplines that support his profession. For what other reasons do medical students study physiology, anatomy, biochemistry, pharmacology etc. before they get into proper medical training?

Middle management staff need not have university degrees but they should have not less than at least 4 to 5 years of secondary education.

Information science being a product of new comers to the information handling world is a hybrid of many different disciplines such as mathematics, computer science, systems science, linguistics, communications technology and psychology, to name but a few. Most people feel that every prospective information intermediary should be trained in the so-called 'hard sciences'. Such training would certainly facilitate one's understanding of some of the abstract concepts that permeate information work. My own view, however, is that an average humanities or social sciences based student can be trained as a data processing specialist so long as he has the will to learn a new 'datacratic' language and provided there are well qualified instructors to teach him. Unfortunately for most developing countries, well qualified teachers of library data processing are hard to find.

(ii) Professional Education

In order to determine what to teach aspiring information intermediaries for university libraries in the developing countries (if they are not to be sent abroad for such training) it would be necessary to:

(a) diagnose the information needs to be met

(b) develop the behavioural objectives to meet the identified needs

(c) prepare a course content appropriate to the needs and objectives and

(d) create the necessary teaching situations by which the content can be interpreted into practical reality.[18]

Information science, library data processing, or whatever name we may call it has its own body of knowledge. Even though it is akin to library science, it employs its own language and uses concepts that may, in many respects, not be readily intelligible to most librarians. It is partly for this reason that librarians and information scientists do not seem to speak the 'same language' although both camps are involved in the same business of information transfer.

Aspiring information intermediaries should adopt a good attitude to computer technology and look at it as a tool for optimising information transfer. They should be prepared to learn, speak and understand the new 'datacratic language' that is "spoken" and "understood" by the computer family. This would include a working knowledge of computer programming. Intermediaries can act as agencies for information transfer only if they can transmit information to the person who needs it. They should, therefore, be taught communication skills so that they can communicate better. They would need to be knowledgeable about (the contents of the) documents containing potentially useful information. Only then would they be able to repackage such information and pass it on to where it is required. This means, by implication, that university library staff will require some subject knowledge in order to distinguish between documents containing potentially useful information and those that do not.

In order to maximize exposure of newly acquired potentially useful information contained in lengthy journal articles or reports, information intermediaries will be required to index and abstract such information for immediate use by university library users. They will, therefore, have to learn some indexing, abstracting and techniques of developing their own thesauri. As literature (document location) search specialists, such persons will have to learn how to develop and use effective search strategies in order to save the time of the information seeker, to restate Reanganathan's 4th Law of Library Science.

Whether one is to use computer technology or not, one will have to learn how to

(a) Design an information system -- including determination of the content of such a system, form of indexing, access, services to be offered etc.

(b) Collect Data for the information system -- including ability to locate and acquire source documents of potential use. This activity might be impaired by the lack of bibliographical control which is prevalent in many developing countries.

(c) Process potentially useful documents--including development of vocabulary control, thesauri etc.

(d) Publicise the information system in order to maximise its utilization by the users so that the cost incurred in putting it up can be justified.[19]

(iii) Continuing Education

It must be recognized that not every library can hire, at any time, all the people who are adequately trained in information work. Existing library schools should be encouraged to initiate library data processing courses to which some interested full-time university library employees can be admitted, as continuing education students. Workshops conducted by library schools or individual information specialists could be undertaken to enable those interested in grasping the basic rudiments of information work to do so.

Conclusion

Developing countries will, in the future, need to tap more and more scientific and technological information for development. University libraries as agencies for information transfer will, in the future, have to brace themselves for more sophisticated information needs demanded by their parent organization (universities) so that the two will play their corporate role as change agents. Librarians will have to adapt to the dictates of the time by acquiring the necessary academic and professional education either through formal schools of library or information science or continuing education.

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DEVELOPMENT OF MODERN INFORMATION TECHNOLOGIES AND THEIR IMPACT ON RESEARCH

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ABSTRACT

Modern information technologies, frequently borrowed from other disciplines, need to be approached by librarians with open minds so that the full benefits of their application may be realised. Our location in the Caribbean, relatively close to the centres of computer-based cooperative information services, is advantageous because telecommunications charges for certain type of connection are tolerable. All opportunities to compete in the information field on equal terms with more developed countries must be grasped since information has become the critical productive input in the economy and countries unable to make efficient use of modern information technologies will find their relative lack of development becoming more pronounced.

Our profession supports research in two basic ways. Firstly we provide catalogues and indexes to, and occasionally abstracts of information we have gathered, and we organise that information in an orderly fashion. Secondly, we provide access to the information itself.

2. Since successful research needs to be based on a thorough grasp of the existing knowledge in the area of the research, our role is vital, and our effectiveness tends towards increasing the complexity of our task. For from each research project there flows additional information to augment the store we have already organised.

3. That I have so far avoided the words "articles", "books", "published", and the like, is deliberate. Information today is available in many forms and we have to treat with them all. The most recent developments in information technologies have caused some well respected commentators to suggest that we are on our way towards a paperless society[1].

4. My own recent experience of being unable to borrow the operator's manual for a micro-computer to study the machine's capabilities because the manual was available only on a diskette shows how close we may be coming to that happy state. The same machine, incidentally, also has a diagnostic diskette. They may have dispensed with the technician's manual too!

5. Before identifying the impact that the development of modern information technologies is having on

on research I must first set a time frame. I did my diploma in Librarianship in 1966/67 and I choose to label all the developments which were regarded then as significant advances, and of course, all the developments which have ocurred since then, as modern.

6. But I want at the outset to warn against an attitude which seems to afflict our profession. As an example of that attitude I take you back to the time when the typewriter was a modern invention. Handwritten entries appear in the British Museum catalogue up to at least twenty years after the equipment was generally available. Let us in the West Indies not take that long to utilise the modern developments of our time.

7. The heartening evidence is there that, at least in the wider world, progressive information professionals are quick to utilise the capabilities of machines and techniques originally designed for other purposes to improve the efficiency of the service they give. Computers were certainly not designed originally to solve library and information problems. If they were, they would not be called computers.

8. Several years ago, in December 1976, I visited the headquarters of OCLC. That organisation had developed computer programmes which permitted the term Co-operative Cataloguing to take on an entirely new meaning. Some of the group visiting that day are present here today and I well remember the reaction to Fred Kilgour's comment that bibliographical entries with incorrectly spelled names are frequently as easily retrievable as those with no errors. That a bibliographic system should

tolerate errors seemed to send a shiver through the group - or it may have been the sight of the first gentle snowfall of a winter just beginning and a premonition of the havoc it would cause before being chased away by the spring of 1977.

9. And back in the 1960's when Donald Urguhart was developing the National Lending Library for Science and Technology, using an assembly-line technique highly reminiscent of Henry Ford's style, and arranging the periodicals alphabetically by title (to the horror of the traditionalists), he was not deterred by the comments that librarians had never done it that way. Maybe the fact that he was not, himself, a professional librarian helped him to think laterally. Whatever the reason, his unit, now part of the British Library, Lending Division, is without doubt the most comprehensive and efficient storehouse of and access point to published periodicals literature in the western world. And the periodicals are not even classified!

10. The two examples above are of institutions which reflect the creative thinking of the individuals who saw them through their formative stages, who used the new technologies available to them to provide new services and to introduce efficiencies in the method of providing old services, even if it meant doing away with traditional procedures. They also represent the two mjor thrusts of the information business; Universal Bibliographical control and Universal Availability of Publications. I use the terms by which IFLA identifies these programmes but I am prepared to predict that the

latter term, because it includes the rather limiting "publications", will soon need revision. The root from which the term "bibliographical" is derived is also limiting but it comes from a foreign language, and so we who speak English breach its limits with impunity.

11. Yet another interesting aspect of the operation of these two institutions is that their sphere of influence is, in each case, extensive. BLLD offers its services world wide using the postal services as the major means of communication. OCLC is technically capable of offering its services world wide too, but, since the link is via telecommunication channels, the expense involved has until recently limited its parish to mainland North America. Signs of the extension of coverage which is possible can be seen in the use of the system by libraries in Australia, Finland and Hawaii and the active canvassing of libraries in Great Britain and Europe which has been underway since 1981.

12. I make this point about coverage to indicate that the Caribbean need not be involved in the high-tech central operations so often associated with modern information technologies to benefit from the systems developed. A simple user-friendly terminal and adequate telecommunications may be all that is needed. Geographical proximity to the site of these co-operative or service operations also helps. There is no doubt that we in the Caribbean are more favourably sited than our colleagues in Asia, for example.

13. Some of these services are for us in the Caribbean quite cost effective. I am convinced that the

charges for the use of data base files are only possible because development costs for hardware and software are spread over an extensive consumer demand base. It may be that the full costs are not being passed on and that a subsidy is being enjoyed by current users. The statement that NTIS, (to choose an example), "undertakes and develops innovative information products and programmes appropriate for Government, but which have the potential to become self-supporting"[2] carries the strong suggestion that the development costs are not passed on. Also, many of the data bases now available for searching online were first put into machine readable form so that the cumulations of the abstracts or indexes, published in traditional hard copy format, might be more easily produced. Clearly the published version would have borne a significant proportion of the developmental work, (as anyone who purchases the hard copy feels instinctively)!

14. But it is not the relatively inexpensive charges that are the major attractive features of these data bases. It is the power of the programming and the ability of the searcher to devise a search strategy and to modify it as may prove to be necessary, to use the file itself to determine the best choice of words and phrases for the search, to search through several different files whose contents overlap (in appropriate Boolean fashion) the subject of his interest, to establish a search and save if for repeated use as an S.D.I tool, and to order the document itself.

15. Furthermore, one pays only for what one needs and uses, and it is this feature which makes the cost

benefit analysis look good. Even though we have to add the telecommunication charges to the cost of searching the files, our ability to avoid paying for what we do not need allows us to use our reference funds more efficiently and thus satisfy more enquiries for less money.

16. The modern data base service is an effective marriage of the abilities on the one hand, to identify the information needed and, on the other, to provide the information itself, that latter aspect leading us naturally into another example of modern information technology influencing research.

17. Single copy publication on demand, at rates which are reasonable, has done much for the availability of publications. Many reports generate so little demand that traditional reproduction would be incredibly expensive even if the demand could be accurately predicted. Single copy publishing, in hard copy from a microfilm master or in microfische copy from a microfische master, is now well established as the answer to the problems of cost and, in the case of microfische, of postal transfer from information storehouse to end user.

18. I referred earlier to the fact that the files on which these on-line data bases are established were initially the by-product of a traditional publishing exercise. Today, however, we find that nearly 1/5 of the files available on Dialog, to choose an example, have no published counterpart. There is also the distinct possibility that the attractiveness of using the on-line file will act to reduce subscriptions to the published indexing and abstracting journal where both exist,

reducing the edition size of the latter, forcing its subscription price higher, and reinforcing the attractiveness of the data base service.

19. The computer has featured prominently in operations which enable information professionals to provide a better service to researchers. The production of Science Citation Index is yet another example of a service which could not be contemplated without automation support. The usefulness of SCI's unique feature which allows a researcher using citations to track the development of a subject forward in time, rather than backward, is probably not of the same order as that of some of the other applications examined earlier. But in some cases especially those where an important discovery spawns new work in several fields it may be the only way to discover easily all the more recent developments.

20. But let me return for a moment to the matter of the communication links to services in metropolitan countries.

21. The various services which are accessible via the telecommunication channel place different demands on those channels. Some tolerate the relatively slow but significantly cheaper 300 baud connection. Others require the speed and fidelity of good quality high speed links (say 2400 baud) if the maximum benefits are to be derived.

22. Thus the usual data base search, where the rate of access is limited by the typing speed of the searcher

and where initially the replies are simply numbers indicating how many items have been found associated with a particular index term or boolean group of terms, is adequately handled at low speeds as long as one recognises that the printing on the terminal at the end of the search of long lists of references and abstracts is contra-indicated. The programmes all permit the off-line printing of such long lists and their rapid despatch by air to the customer. Here again our geographical proximity is beneficial.

23. The bibliographic utilities on the other hand send down the line with each successful hit much larger volumes of information, complete bibliographical data. The system also arranges for verification by automatic referral, so the information is never sent in one direction without being reflected for checking. Any edited version of the data made necessary by variations revealed by the edition being catalogued is also bounced back before being accepted at the utility as the customer's record. Speed and fidelity are of the essence here and one pays for these attributes.

24. In larger developed countries, cost sharing can be achieved by the use of state-of-the-art communication techniques. OCLC, for example uses 2400 baud, full duplex, multidrop lines, each line capable of handling up to 25 terminals through a synchronous, polled communications protocol. The use of such dedicated access appears expensive to us in the Caribbean only because the scatter of our library development is such

that we cannot find 24 near neighbours with whom to share the line and its costs.

25. I have raised in another forum the possibility of negotiating an educational discount for such use of of a dedicated link. There is no doubt that by allowing us to compete in the information field on equal terms with more developed countries the stimulus to development would ultimately generate more commerical traffic on the channels. Also the initial subsidy would be reduced as, with development, more libraries joined the network. And in any case, there is, I believe, considerable spare capacity at the moment.

26. There has been no assumption as yet in this paper that the research on which the modern information technologies are making their impact is solely research which will contribute to the development of the countries of the region. But you will have noticed that the argument for subsidising the telecommunication rates is based in the main on the effect such a concession could have on the development processes.

27. To put the point another way, countries unable to make efficient use of modern information technologies will fall farther and farther behind, their relative lack of development becoming more pronounced.

28. Courtney Blackman, Governor of the Central Bank of Barbados, in an address in January of this year delivered in neighbouring Curacao, supported this view when he argued that information has replaced energy as the critical productive input in the economy, and that

societies unable to cope with the information explosion can hardly achieve economic development[3]. He was speaking as an economist to economist but he really ought to have been talking to librarians and information specialists. For the conclusions to be drawn from his thesis place a tremendous responsibility on people like you and me.

29. Fortunately, technology is on our side, and as developments continue to supply us with more powerful tools at lower prices, we in the Caribbean have an opportunity, which was never before available, to close the information gap. And by closing the information gap we will also close the development gap.

30 Mme C. Cartier, speaking on the importance of networks in the present context of the world of information at the 1982 IFLA Conference in Montreal devoted much of her address to the opportunities offered by modern communication technology and she emphasised the importance of eliminating "all forms of isolation in any country whatsoever". Her point is well taken, for the tools and services which now make possible great improvements in the communication process can easily promote the creation of information elites if their use is restricted in anyway, either by accident or by design. We must guard against such an unfortunate potential disadvantage becoming a reality.

31. What of the future. Few would disagree with the prediction that the rate of change will be more rapid in the years ahead that it has been in the past. My guess is that research will be supported less and less by large traditional collections and more

and more by access to information stored at quite remote locations. Will we subsidise access to that information in the same way that we now subsidise access to the printed word? Will the Library schools anticipate these changes with radically altered curricula or will they merely adapt, post facto, to the changes as they take place? Are Caribbean researchers aware of the adjustments they will have to make?

32. Perhaps the answer to these and other questions I have raised will be provided by some brave soul during the discussion period. If our profession does not adapt to the changing situation we will be replaced as information managers by others more willing to use the opportunities provide.

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